VOL. XXVI NEW YORK—THURSDAY, JANUARY 18, 1912—CHICAGO No. 3

THE AUTOMOBILE

Extending the Boundaries

How the Field of the Commercial Car Is Widening

VIEW OF THE GARDEN COMMERCIAL SHOW, LOOKING FROM THE MAIN ENTRANCE

FIRST in importance to the world of industry, has been the progress achieved by the automobile business-wagon during the past year. At the beginning of the present year every line of business in the land that requires the transportation of goods uses some form of commercial vehicle. During the past year the use of freight automobiles has increased remarkably and operation under varied conditions has demonstrated betterment of service and economy resulting from their use.

There are five elements of time used in truck operation, as follows: Time of loading; time of running loaded; time of running unloaded; time of unloading and idle time. The time of running loaded is the only revenue producer of the five and anything that can be done to increase the economical operation of trucks under load and to decrease each of the other items will aid in solving the problem of transportation.

If one of the four unproductive operations can be curtailed it allows the time saved to be devoted to profitable work under load. An analysis of the situation with respect to each of these items shows clearly the development of the business wagon. Loading is shortened by using properly sized cars, equipped with bodies suitable for the class of service to be rendered. Such bodies as are shown by Packard, Peerless, Mack, Saurer, Commer, Gramm, Knickerbocker, White, Pierce-Arrow, Grabowsky and many others are typical of the development that has been made in this respect. If the bodies are the right size for a particular line of work and are specially suitable for it, the work of loading may be abridged materially. It is estimated that

Looking Diagonally Across Madison Square Garden from the Northeast Gallery

an average of two hours a day can be saved by the use of proper bodies in the single element of loading.

In the element of unloading time, the special dumping bodies open up a new field in urban service. Take for instance such dumping bodies as are shown by Sampson, Morgan, Mack and Gramm. These are large trucks and the dumping process is accelerated to such an extent that one man operating the power of the car can empty the load almost instantly. As compared with the old method of moving the load by hand, these systems will save from 2 to 4 hours a day.

The other elements depend largely upon the amount of work there is for the trucks to do. It only costs the interest on the purchase money and insurance to allow a truck to stand idle, or about 12 cents an hour for a $6,000 truck; not reckoning, of course, the wages of the crew. Horse equipment of the same size would cost a minimum of 60 cents an hour while idle, because the horses require feed and attention whether they work or not. The storage expense would also favor the truck.

In such work as garbage, ash and snow removal and in building contracting, heavy hauling on fast schedules is the rule and there is little idle time to be considered, therefore anything that will quicken loading and unloading will measure the increase of actual service and consequently the revenue from operation.

In delivery work this rule applies in modified form, taking the shape of smaller equipment for the same volume of work unless the additional facilities for delivery develop a larger amount of business.

In freighting and express lines the advantages of economical loading and unloading are palpable.

It is exceedingly difficult to furnish dumping trucks with loads both ways and the same may be said for retail deliveries and for many other forms of truck activity, but something can be done to ameliorate the waste of long empty hauls. The field, however, is so limited that it would seem unlikely that any radical improvement is possible except in specific lines of work such as express, auxiliary railroads and similar enterprises. The fact remains that almost 50 per cent. of the running time must be unproductive of revenue.

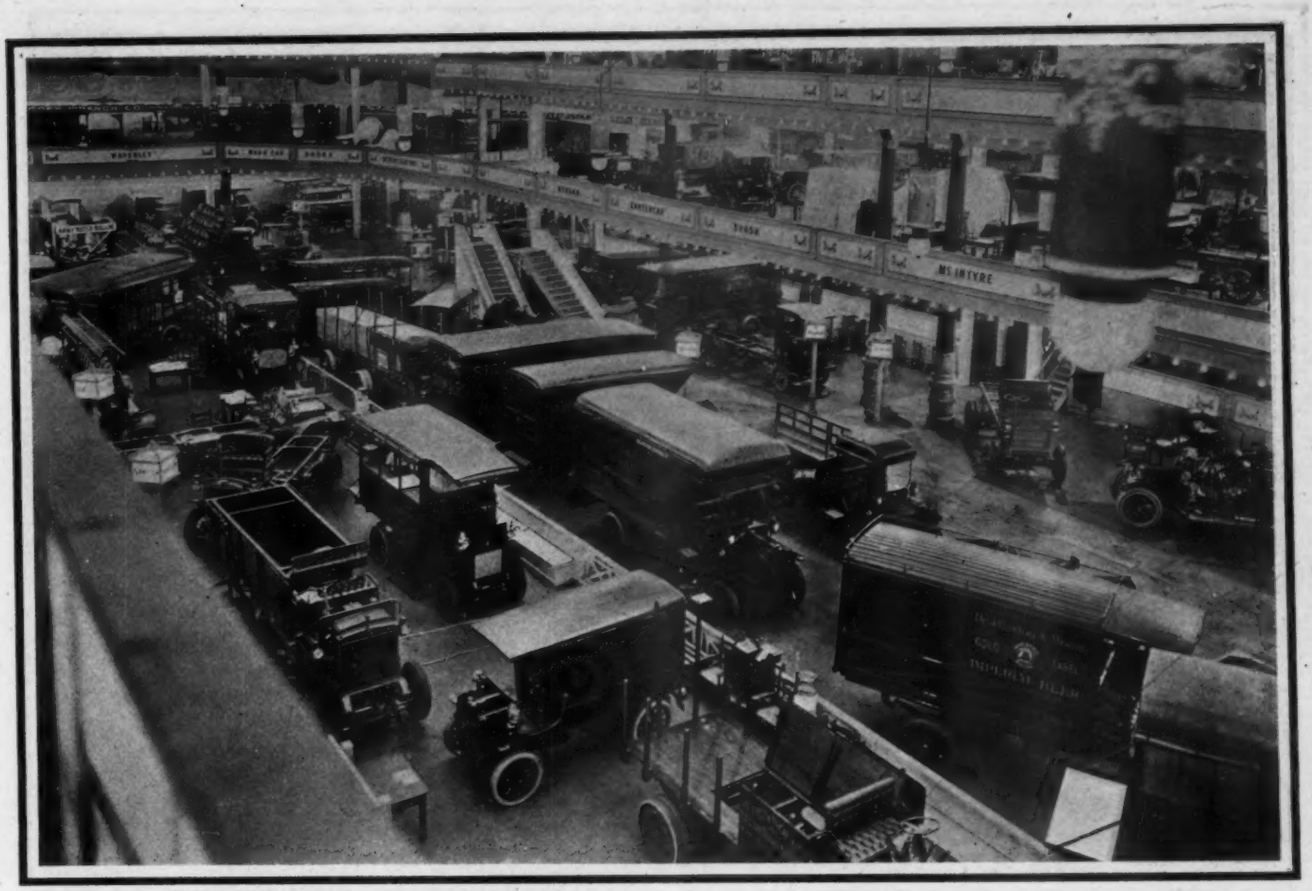
The general conclusion to be reached is that a saving on any of the non-productive stages of operation means the possibility of increasing the productive stage.

Among the newer fields into which the automobile truck has been introduced with much success is in the service of land and development companies. In this line of work the trucks are fitted with seating accommodations for passengers. They are generally of from 1 ton to 2 tons in load capacity and have seats for from ten to twenty passengers. These trucks are used frequently to transport purchasers of houses in outlying sections to the steam or electric lines that connect the suburb with the city.

New Fields for the Commercial Car

Their mission is temporary because they simply take the place of other forms of transportation pending the installation of permanent lines, but their use is of far reaching significance. It is estimated that there are probably fifty trucks used in this way by land companies located in scattered sections of the country. Without some such form of transportation these recently opened lands would not be habitable for the time being at least. Thus without the trucks used in this way, it is apparent that some pretty big real estate developments would have to wait.

The land companies also have shown a fondness for trucks that are convertible into passenger carriers for use in carrying prospective customers to and from their developments. Roads are notoriously rough, as a general rule, in approaching a new



General View of the Main Floor and Elevated Platform Exhibits from the Northwest Corner of the Garden

real estate development and the speed of a big touring car would be out of place in such work even if it had the body equipment to carry sufficient passengers.

Farmers Taking to the Motor Truck

In previous seasons, farmers have been hard customers for the truck companies. They pointed out that the hauling season is short, where their crops are limited to few products and that it would be uneconomical for them to buy big trucks that would be useful only a few weeks in the year. But lately this attitude has been changed. The producer of agricultural yields is beginning to see that his great opportunity lies in the direction of securing the best transportation and finding means to keep that transportation employed. One progressive New Jersey farmer's experience may be cited to show the working of the idea. This man has 60 acres near Paterson. He has a bunch of cows; raises berries on 5 acres; garden truck on 10 acres, and grain and fodder raising take up all the rest of the property save for the pasture used by the cattle. He bought a 1,000-pound truck last spring and found that he did not have to rise at 2 o'clock in the morning in order to get to his market ahead of his competitors. Every market day, since buying the power wagon, he has been on hand with the first of the produce sellers and the result is to be seen in his improved financial condition. His milk is always on time to catch the train; his berry patches were picked clean and his garden truck brought in a better return than ever before. The reason for the increased yield of berries and garden truck lies in the fact that he was able to work his horses in cultivating and personally was able to spend more time in that line of production because of the smaller amount of time necessary to get the stuff to market. The man averaged $93 an acre net from his whole farm, which is kept up in excellent condition. His best year previously had averaged $71 an acre net.

Of course, the truck did not do all that. But it did release the horses and the owner from a certain amount of unnecessary drudgery and the increased energy thus supplied accounts for the difference of $22 an acre. There will be other trucks sold in the Paterson district.

Another farmer, whose crop consists largely of grain purchased a 1-ton truck early last spring and at the Palace show last week he recounted his experience. His hauling of grain required only eight weeks all told; hauling of other main crops, six weeks; garden truck, twelve weeks; dairy service, one trip a day for 267 days, covering 12 miles. This work had been done before by two wagons and four horses and took the whole time of two men. All this resulted in centering the saved horsepower and man-time on cultivation and the perfection of systematic work.

But even with all that, the truck was not kept busy, and, as a convertible passenger body had been purchased with the truck, a regular passenger service was established between the market town, 6 miles away, and a summer resort 3 miles beyond the farm. This was pretty well patronized all the year around, but proved a gold mine between harvests. Since April 1, 1911, this truck did 42 miles a day six days a week and 25 miles on Sunday. The gross revenue from passenger hauling was $1,109, while the increased revenue from the sale of farm produce of all kinds was $1,654. The total wagon mile cost of operation and maintenance was 6 cents, figuring on writing off the cost of the truck in four years and providing for overhaul. The total costs, including the sinking funds, were $648.18, which shows a net profit from operation of over $2,000 in nine months.

It will be argued that these are exceptional cases and the charge is probably true. Farmers with as much energy, understanding and intelligent industry as these two would succeed somehow under any circumstances.

View of the Main Floor and Elevated Platform from the Press Gallery

For the farmer who has strenuous use for his horses in harvest time and who has or can invent some economical use for the truck in dull seasons, the idea of installing such machines must prove forceful.

Field Widening in the Large Cities

As far as city use of the automobile business wagon is concerned, the most speaking illustration can be found in comparing the business of the merchant who uses power wagons with that of his competitors in the same line who do not. No comment is necessary; simply select two typical concerns and see which one is dying.

Undertakers have adopted the power wagon readily and generally. In this great humanitarian industry the demands come at all hours, for death waits on no man. Speedy service is better than delayed service, particularly in case of death, and thus the undertaker has to have an adequate wagon equipment. The undertakers who have taken up the automobile with energy have found that their radius of usefulness has been doubled without enlarging their equipment.

Bakers also have gone into the matter of quick, certain transportation as may be seen from the special effort that is being made to supply their needs in the way of small trucks and deliveries.

Export is another outlet for power wagons that is coming to the front in relative importance. Hawaii, the Philippines and Porto Rico are fertile fields for this type of business. In the Philippines many big trucks are being sold, one company showing at the Palace having just shipped five wagons, and another is preparing to ship three. In Hawaii there is a fair demand for 1-ton trucks for work in the sugar fields. In Porto Rico the business is still in embryo. There is a potential possibility for considerable business in that island.

But the main feature of the export trade is the prospect of business in South America. For years past the South American countries have been using French and German trucks with considerable success. In order for the American manufacturer to get this trade it will be necessary to build as good a car as the foreign manufacturers and to sell it at a lower price, insuring service and providing facilities for maintenance.

One big maker of trucks in commenting on this situation said: "I do not know how my South American customers operate their trucks, but I do know that two of our wagons which were sold last year have not been heard from in our service department at all. The only word we have received from them was a re-order for tires. No truck can be given enough hard service to wear out its tires without needing some sort of mechanical adjustment at least, but I am sure I do not know how their repairs are made."

As regards the situation generally, it may be said that a distinct increase in the number of trucks in use in all lines has been made. There has been no backward step and the business is on a healthy footing.

The future extensions of business are somewhat shadowy. It seems almost impossible to discover any perfectly new field of usefulness and yet such an idea is being formulated. It is of immense scope and importance and if adopted will prove an enormous stimulus to the trade. It is nothing less than the installation of auxiliary feeders for the railroads.

The plan suggested is to establish a regular freight and passenger service in localities somewhat remote from railroad facilities, using trucks of adequate size and carrying capacity. The great difficulty with life in isolated sections is the simple fact of isolation. It is costly to haul freight and passengers over the roads by horse power. It is also slow and besides taking the time of horses and men that could be better used in

developing the farms or mines or other enterprises, it is too costly. There can be no question that the installation of a motor truck service into districts, say, 20 miles from a railroad will bring a material amount of shipment from the farms or mines that can not be had under present conditions.

Motor Truck as Railroad Adjunct

But, while this is of much importance to the railroads, the other side of the proposition is vastly more so. Suppose that such a truck auxiliary were established in Nebraska, Oklahoma, Texas or the far Southwest, requiring a long and expensive rail haul. It is as certain as anything in the future can be, that the residents of the section would buy more merchandise as they shipped more goods. Both ways the railroads would collect tariffs and revenues would be swelled in proportion to the growth of the traffic.

Take a mining proposition as an example of what might be done: Mines are usually located in more or less inaccessible localities. Railroad shipping points are in many cases 50 miles or more from big mines. Goods destined for the use of the miners, mining machinery and explosives have to be hauled long distances by freight wagons drawn by horses. With some preliminary work on the grades of the trails, nearly any of them can be made passable for the motor truck. People do without things in such mining communities because of the difficulty of transportation but would use them if they were easily available. There can be no doubt that the freight business to and from every isolated mining camp in the United States could be much increased if transportation were made easier and the automobile truck would make it easier in practically every case. This increased business in either and both directions would pay for a long rail haul with a corresponding boost in revenues.

The proposition is being seriously considered by more than one railroad genius and it is not unlikely that 1912 will see the installation of several trial auxiliary railroads in the Southwest.

The figures embodying the cost of such an enterprise with probable returns as tabulated by one of the important railroad men engaged in solving efficiency problems are as follows:

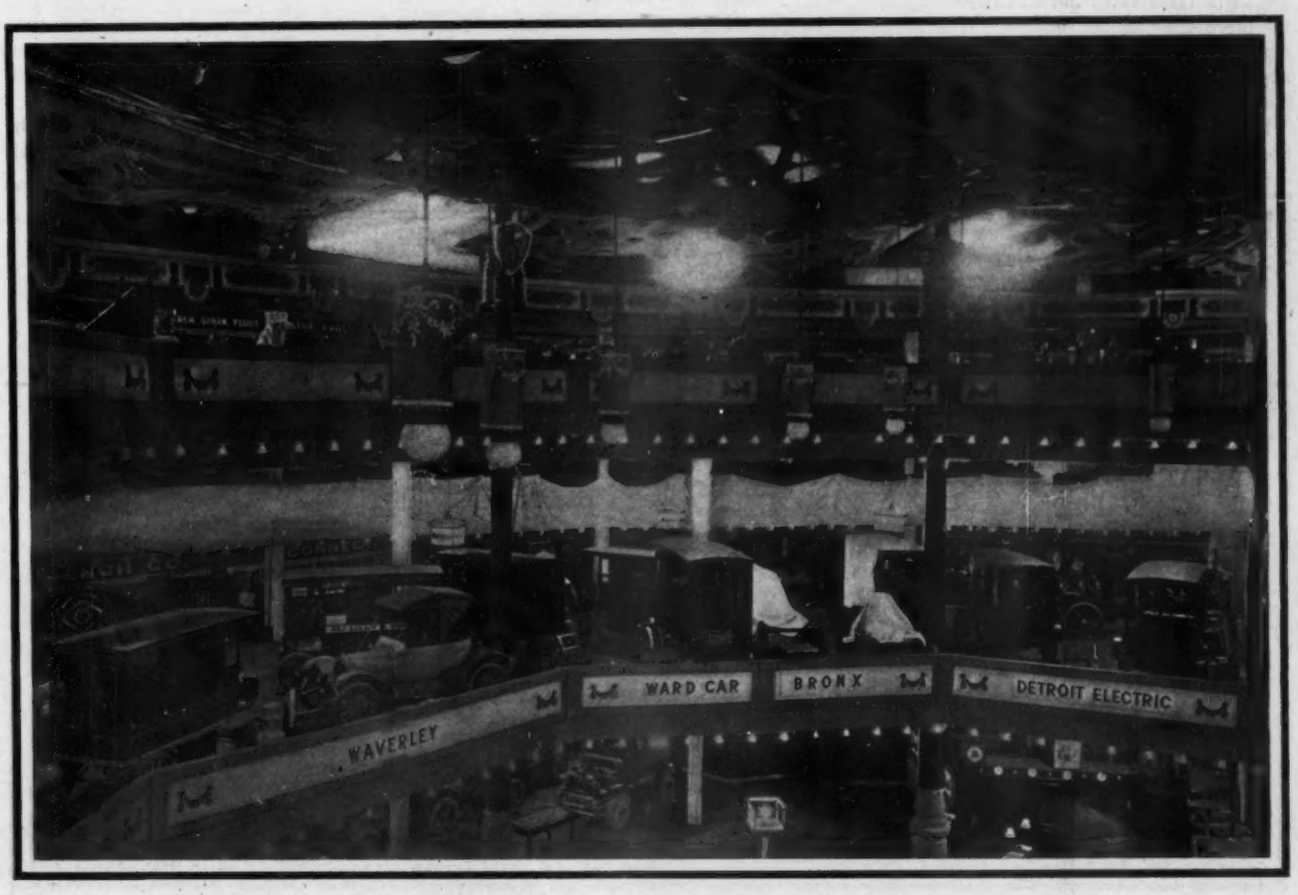
Costs		Revenues	
Three 3-ton trucks	$14,205	Increased freight out (ton miles)	100,000
Wages, 12 men	10,245	Increased freight in (ton miles)	60,000
Operating expense at 50 miles a day	22,320	Tariff charged for truck hauls	$32,000
Maintenance	5,580	Railroad tariff	105,000
Sinking fund	6,000		
Total	$58,350	Total	$137,000

This indicates a net profit from operation of three trucks of about $95,000 a year, not including the original cost of the trucks, but taking cognizance of maintenance and sinking fund. But in addition it will probably be found necessary to expend $200 a mile on 150 miles of road used for this class of transportation and thus the net revenue would be cut down by $30,000. This would leave a net profit of $65,000 a year, which is enough to buy quite a number of freight cars, or to pay the wages of the average executive department. The estimate is based on considerably less than full capacity of the trucks for approximately 85 per cent. of full time.

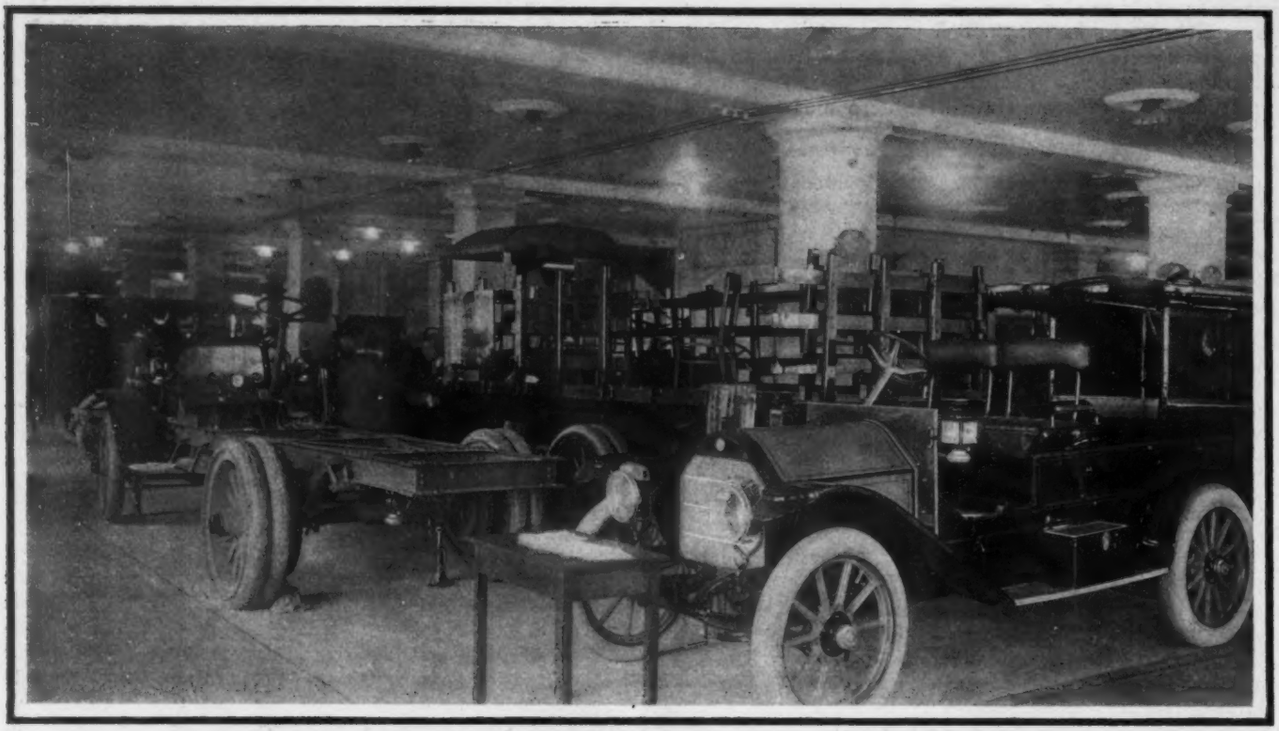
In the mining camp auxiliary railroad work, the cost of road improvement and maintenance would be higher, but so would the freight revenues and it is likely that the same ratio of gain would be shown.

Naturally the operating companies would not have to make all the road improvements, but it is safe to say that they would be obliged to do most of it.

The establishment of such enterprises on a paying basis should not require much time if the country in which they are introduced is sufficiently productive to furnish the business. It is a palpable fact that many isolated communities do not raise anything like their capacity because of the obstacles to trans-



Showing the Light Cars in the Southwest Balcony, with a Peep at the Gallery Accessories Exhibits



Showing One Section of the Excellent Commercial Display at the New Grand Central Palace

portation and it is equally certain that the added production would be welcomed in the centers of population here and abroad.

Quite aside from all these things must be considered the increase in farm valuation and the opening up of more territory; the increased habitability of the sections served in this way; the improvement in living conditions that must follow better facilities for transportation and the service performed toward humanity by increasing production and making exchange easier.

From the viewpoint of the manufacturer of trucks the situation holds much significance. Railroad building is at a standstill throughout the United States, according to such an authority as B. F. Yoakum, chairman of the board of the Rock Island-Frisco system.

The need of transportation, however, does not stand still for a minute. The land is attracting more producers each year and they require a mart to buy, a mart to sell and a means of transportation. If there is to be no more general railroad building, the problem must be solved in some other way.

One way appears to be through the instrumentality of the automobile truck as an auxiliary to the existing railroad lines.

The Palace Construction Is Such That a General View of the Big Truck Exhibit Was Not Possible

Mais Co. Reorganized

INDIANAPOLIS, IND., Jan. 13—Stockholders and directors of the Mais Motor Truck Company reorganized the company at a meeting held in this city last Wednesday. This action followed a recent increase of $75,000 in the company's capitalization, and the concern is again on its feet. The recent receivership suit brought against the company has been dismissed by mutual agreement of all parties concerned.

Under the reorganization, Will H. Brown continues as president and general manager, while creditors of the concern are given an active voice in the management by an executive board. J. D. Stimson, of Huntingburg, Ind., has been elected vice-president and Alvin S. Lockard has been elected secretary and treasurer. Albert Mais, who recently left the company, was formerly vice-president, while Hiram Moore was acting secretary and treasurer following the recent resignation of A. W. Markham.

The executive board consists of Mr. Stimson, Mr. Lockard and H. G. Francis, of Rushville, Ind. The company has purchased from the Jenney Electric Company the factory buildings the Mais company has occupied since its organization.

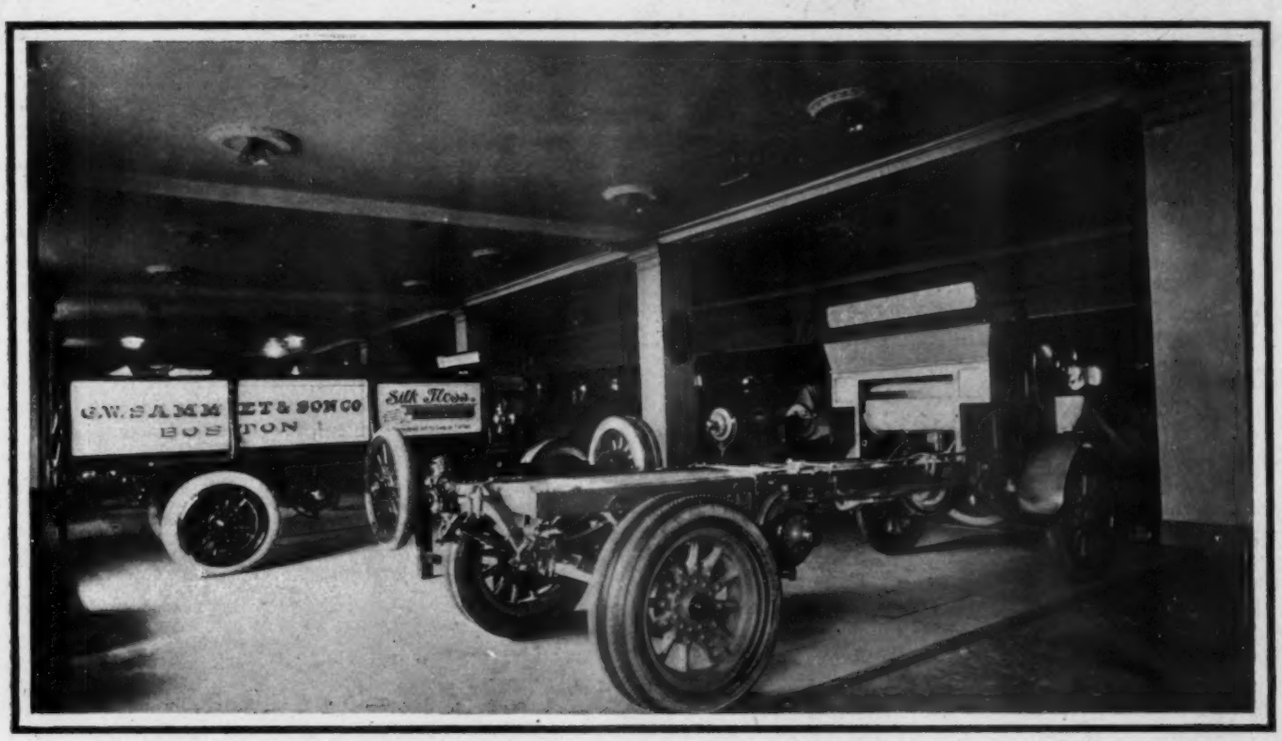
Hoosier Limited's Run

UNDER official sanction of the A. A. A., the Hoosier Limited, a 1 1-2-ton Decatur truck equipped with pneumatic tires, will complete its non-stop run under load at 8 o'clock Wednesday evening after accomplishing 168 hours of service. The truck is under official observation continuously.

The course covered has been largely upon the streets of New York City, but has extended up-state into Westchester county; Connecticut and Long Island. Weather conditions have been severely trying to car and crew, but so far the truck has answered all demands.

After the end of 168 hours of running, the Hoosier Limited will head nor'east by east and lay a course for Boston. According to the schedule the start for Boston will be made Thursday morning with a full load of oil consigned to the Standard Oil Company's Boston branch.

The same conditions have been provided for the run to Boston that have obtained during the seven days the car has been operating around New York. Stanley A. Martin is in charge. Up to noon Tuesday, the mileage covered was 858; gasoline consumed, 102 gallons; oil, 28 quarts, and water, 11 quarts.



Another View of the Palace Commercial Show—In the Big Truck Section

Universal-Flanders Merger Denied

Rumors to the effect that the Universal Motor Truck Company, recently purchased by H. W. Walton, of New York, had been merged with the Flanders Manufacturing Company, of Michigan, and that both these concerns might be taken over by the General Motors Company, met with denial from the heads of the concerns most interested.

However, there is a project on foot to merge the Universal with the Flanders corporation although the deal has not been consummated so far. It was stated at Mr. Walton's office that if the transaction went through it would not be until next week. It was specifically denied that there was anything in the report that a tentative organization to effect this merger had been perfected.

The Universal company is capitalized at $350,000 and the Flanders concern has an authorized issue of more than $1,000,000.

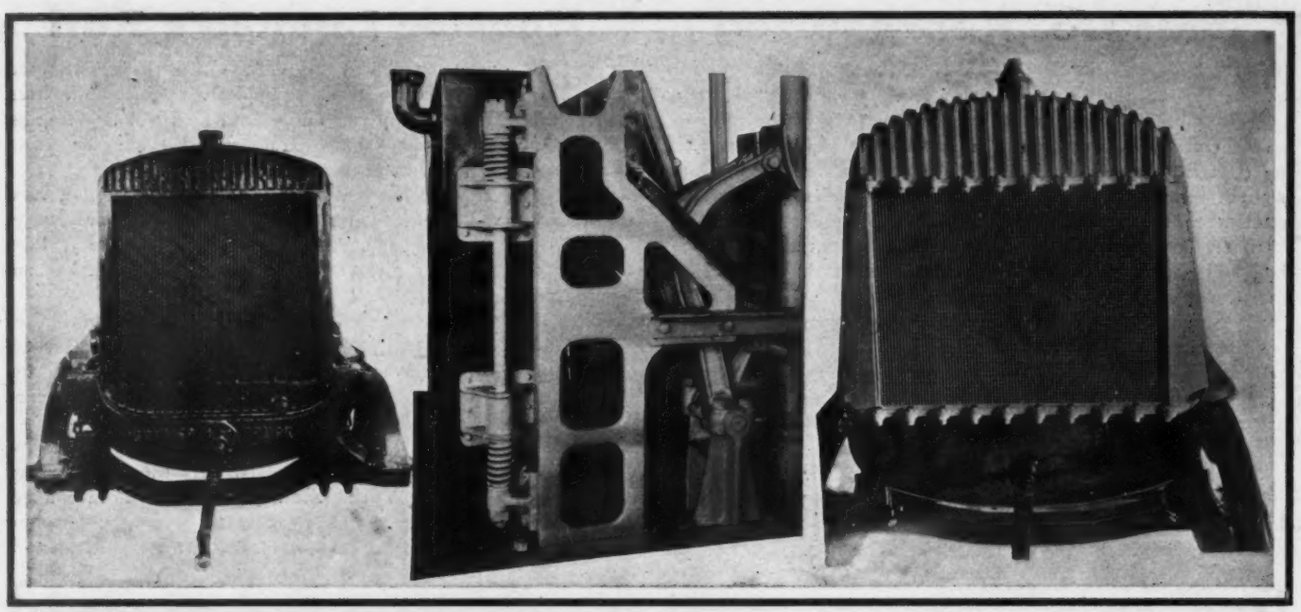
Heard at the Commercial Shows

The Knickerbocker Motor Truck Manufacturing Company is completing a magnificent concrete factory building on East 150th street near the Harlem river. The new building will add materially to the manufacturing facilities of the company. In a recent accessibility test it was found possible to remove the motor from a Knickerbocker truck in less than 25 minutes.

C. J. Widmer has been appointed general manager of the Eclipse Truck Company.

The Chase Motor Truck Company has just finished a three-story factory addition, 80 by 140 feet. This building will be used for assembly of trucks and will house three of the manufacturing departments of the company.

The Rowe Motor Company will be reorganized in the immediate future under the name of the Rowe Motor Manufacturing Company. It is the announced intention of the company to manufacture its cars on a commercial scale.



Commer radiator showing air-cooling features Dayton radiator suspension and steel cab-frame Newark radiator has removable air-cooled top

In the Wake of the Engineer

MANY and varied are the ways in which the makers have met the problems of commercial car construction, as will be seen by even a cursory glance at the machines exhibited at the shows. There are cars for every class of service from the light delivery wagon which will carry a load of a few hundred pounds to the heavy coal or lumber truck with a capacity of 7 or 8 tons.

Yet, despite the variety of uses for which commercial cars are designed, there appear to be several features of construction which lean toward standardization and which are recognizable in one form or another in many of the small chassis as well as in the extremely heavy truck models.

For example, drive by jackshaft and side chains is to be seen on the majority of trucks, in addition to which two contracting service brakes acting on the jackshaft are usually found. While this type of drive commands the greater number of adherents, there are, of course, several cars which have the common form of shaft drive to the rear axle, and two (the Pierce-Arrow and the Newark) which have a worm and shaft drive. For the electrics no standardization in the matter of power transmission to the rear wheels is in evidence. Some of these employ a shaft from the motor to the rear axle, others have one or two chains from the motor within the chassis frame, while still others make use of two side chains on the outside.

In point of numbers, there are about as many of the new truck models which have the driver's seat or cab placed over the engine as there are those which have the seat mounted behind the engine, although the advantages of the first-mentioned location seem to outweigh those of the other. For the same productive length and carrying capacity, the machine having the driver's cab over the engine is generally shorter by an amount equal approximately to the engine length. This admits also of making the chassis shorter, allowing a smaller necessary turning radius. More of the weight is taken off the rear wheels and rear axle and is placed on the front wheels, which is an advantage both because it brings the center of gravity of the whole car nearer the middle, thus reducing the skidding tendencies, and because by adding weight to the front it increases the tractive effort of the front wheels. More uniform tire wear all around would seem to be the natural result.

Semi-elliptic springs are the leading type for the truck constructions, while three-quarter and full-elliptics are generally used on the lighter delivery wagons. A noticeable spring construction is that used on the front of the Buick light delivery cars. The springs used are perhaps more nearly seven-eighths elliptic than they are three-quarter. Very heavy types are placed on the larger truck models.

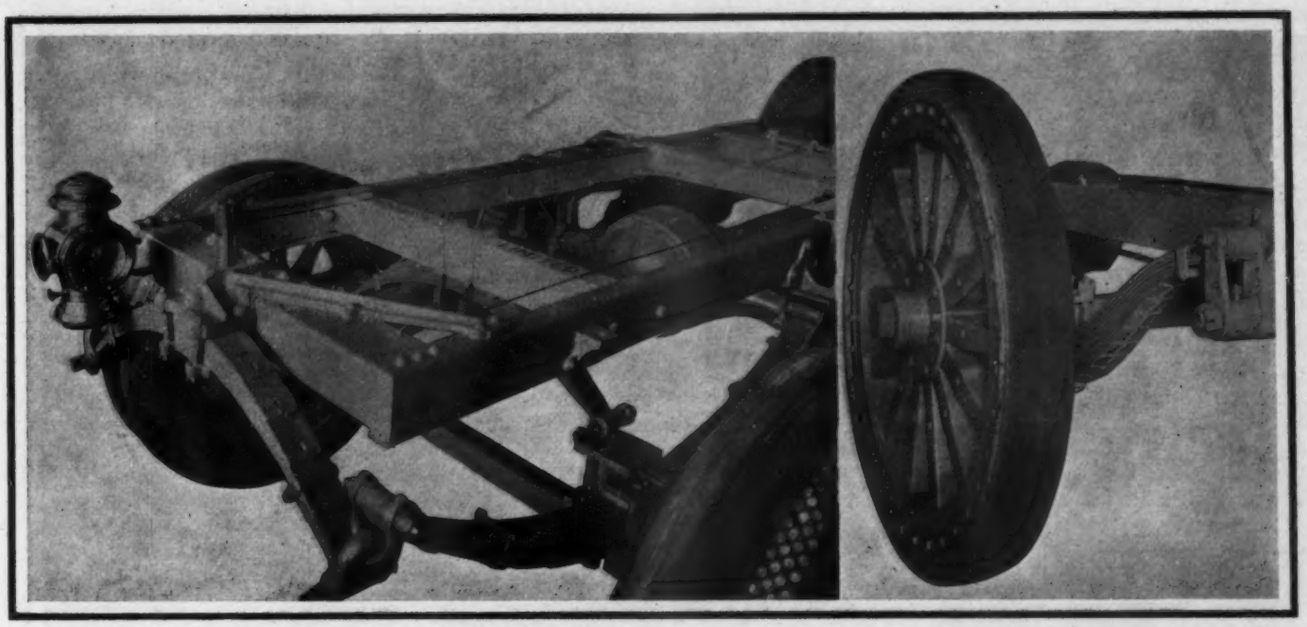
The left-hand drive is more in evidence this year, those using it claiming that there is a material time-saving factor connected with it, as the driver can more quickly draw up to the curb or loading platform when he is accorded the clearer view which it affords of the left side of the car.

Persistent and ever-increasing demands for labor and time-saving automatic dumping bodies have led to the production of many ingenious devices for meeting the requirements of heavy service. Cranks, chains, gears, levers and auxiliary power apparatus are all made use of with varying degrees of success for raising either one end or one side of a heavily loaded body so that the material contained may be made to slide down the inclined side or floor of the body to the desired unloading place. Most of the improved dumping devices which have been brought out are the results of careful study of the particular demands to be met and of intelligent application of the knowledge gained from this study to the mechanical details of the construction.

Dual Rear Tires Regular Equipment

Dual rear tires have been almost universally adopted, on the medium and heavy capacity trucks at least. Only one example of steel-shod wheels was seen at the New York shows, these being used on the Aries 7-ton truck shown at the Palace. Pneumatics are placed on many of the smaller delivery wagons.

Although there are a number of extremely large capacity models, the greater part of them appear to be built for carrying somewhere around 3 tons. This, of course, refers to the trucks, the light delivery cars being designed on the average for much smaller loads.



Rear suspension of the Decatur truck. Note exceedingly high-crowned cross-spring and guide slots in ends of leaves

Forty-two-inch wheel of the Walter truck. The underslung spring is also seen

Tendencies are toward motors specially designed for commercial service, rather than to the use of the same motors for both commercial vehicles and pleasure cars. The truck motor in most cases is individually designed for heavy-duty service and is usually a slow-speed, high-powered type. The T-head motor predominates. This is to be expected since the design permits the valve and valve pockets to be of larger diameter than they could otherwise be made, and, since the hood-space is wider, there is no need for cramping and thereby reducing strength.

New Schemes of Operating Dump Bodies

Among the dumping bodies on exhibit, the Sampson makes use of a unique method of raising the front end. A compressor which is operated by power from the motor stores air under pressure in a tank for the purpose. A cylinder having a diameter of about 8 inches and a 4-foot length is pivoted at the lower end to the truck frame. Within it is a piston, and to the end of the piston-rod a bracket attached to the front part of the dump body is swivel-connected. The admission of compressed air to the under side of the piston by means of a control lever on the dash raises the body through its connection with this piston-rod. As the fore part of the body begins to rise the tailboard or gate at the rear end is automatically raised, causing it to be almost free from contact with the down-rushing load.

The Alco dump body is not of the usual tipping construction, the body proper being firmly fixed to the chassis. On either side there is a wide chute held closed by a steel plate or door. To these doors racks are fastened, their pinions being mounted on shafts which extend to the sides of the chutes, where handles may be applied to turn them and thereby to raise the chute doors.

The bodies on these Alco models are of steel, the joints being gas and electric welded, so that no rivets or bolts are to be seen. For the same carrying capacity they are lighter than wood.

The Speedwell dump body is also of rear discharge design. The raising of the front is effected by means of a system of reducing gears which operate a pinion. This latter plays in a double-tooth curved rack attached to the dump body. Power is applied to the gearing by means of a crank at one side.

On the Gramm, raising of the fore part is accomplished through the use of the engine power. A winch is operated by the motor for winding up a chain attached to the front standards on which the body rests when in its horizontal position.

A bevel gear and screw design is made use of in the Pierce-Arrow model. Turning of the bevel pinion shaft by means of a handle operates a bevel gear, the shaft of which is vertical and is screw-cut. A long sleeve attached to the body registers with this screw, and when the latter is revolved, it serves to back the sleeve off, thus raising the body.

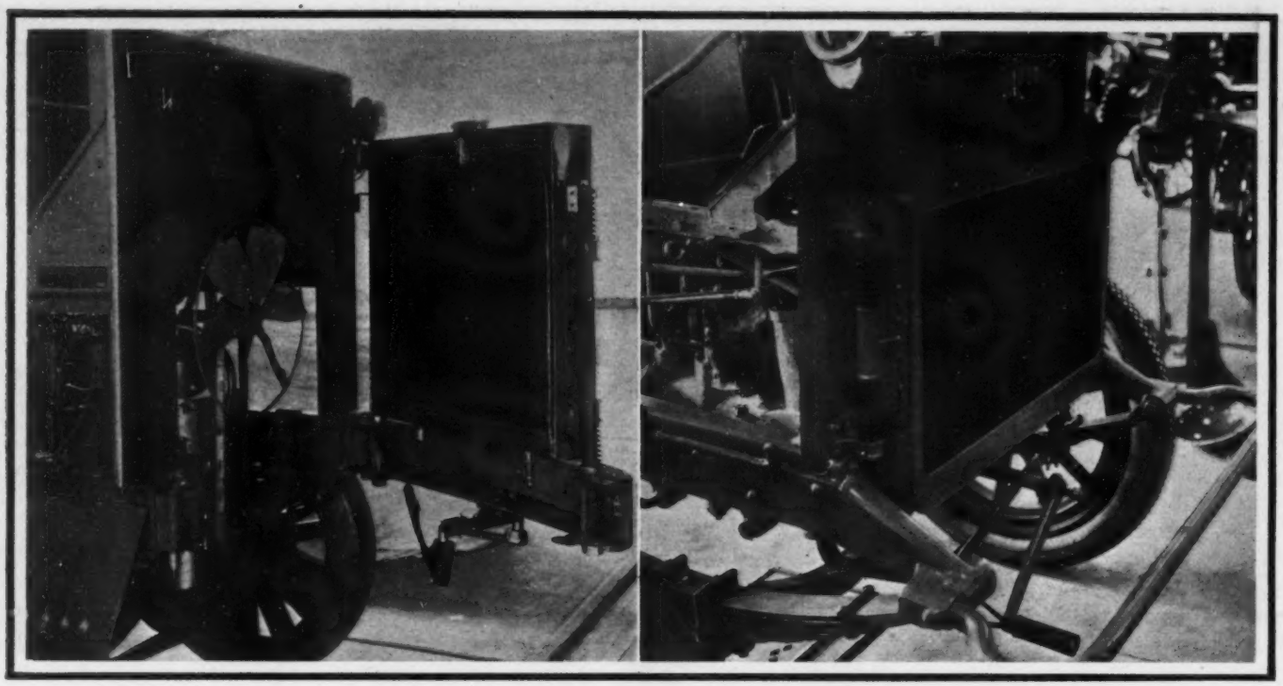
To meet the claims of those makers who have placed the driver's cab back of the engine, that a seat placed over the motor tends to make the power plant less accessible, several schemes for easily getting at the motors of trucks designed in the latter way have been devised. The Knickerbocker machine has its motor mounted on skids, permitting it to be drawn out in front after the radiator, which is hinged, has been disconnected and swung around to one side. The entire Speedwell cab is mounted on hinges so that either side may be raised and tipped in much the same way as the ordinary hood would be done. Other makers who have placed the seat over the engine have made the side openings as large as possible to permit of easy access to the motor and its accessories.

As already stated, springs usually follow the semi-elliptic form, being connected to the chassis in a number of different ways. Very heavy springs which approach the locomotive type are to be noted on the rear of the Hewitt 10-ton truck. Each of these is fastened underneath the large square-section dead axle by means of two substantial shackle-bolts. The normal box is deeper than that usually seen. The peculiar Gramm rear triple-spring construction is retained. The spring ends are not fastened to links, but to rollers which play in slots attached to the frame member. In compressing the spring, the rollers are forced along their slots away from the axle, the object being to prevent any possibility of stretching the spring leaves.

Accessibility is the keynote in these various spring constructions, as the illustrations herewith will show. The nuts on the shackle-bolts are easily reached.

In several of the rear suspensions an auxiliary cross-spring is mounted above the rear axle, coming into play only when the load compresses the frame a certain amount. These are meant to relieve the side springs and to assist in withstanding shocks. Among the examples of this design the Speedwell, the Gramm and the Decatur are of note.

Grease cups are made very accessible on the Morgan trucks, being placed so as to be easily turned from the sides of the vehicle. All brakeshaft bearings and others are provided with these cups, and there are handles which are easily turned for forcing the grease through the cups and into the bearings. This is not an accessibility feature which is confined solely to the



Hinged Knickerbocker radiator permitting motor to be drawn out on skids

The Decatur bumper is attached to the frame in integrally cast sockets

Morgan trucks, as there are a number of others who also make it unnecessary for the driver to worm his way under the frame in order to reach the lubricating devices.

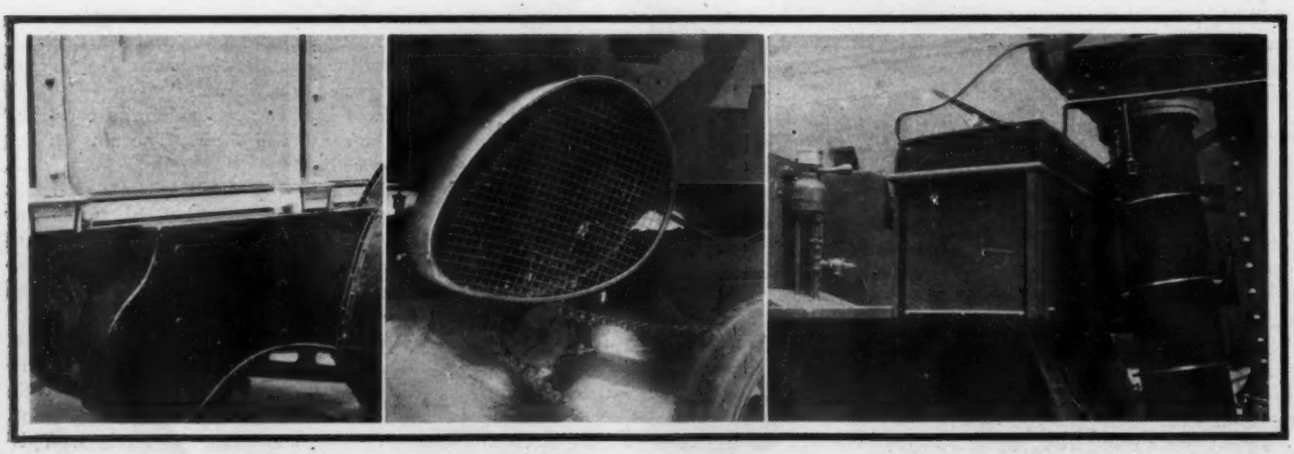
Commer Shows a New Control

A peculiar form of control is placed on the Commer trucks. The spark is adjusted by means of a lever mounted on the dash. For this reason it is really semi-fixed, as the driver cannot as easily reach it as if it were mounted on the steering column or on top of the wheel. The change-speed lever is not placed alongside of the emergency brake lever, but is carried at the top of a vertical column, which is firmly fixed by means of a brace attached to the dash. The lever is horizontal and is shifted over a slotted quadrant, one slot representing each speed.

The Pierce-Arrow speed-changing is also effected through the use of gear-shifting cams which are operated from the driver's seat by means of a horizontal lever.

In the matter of radiator suspension, springs seem to be used extensively. In most cases provision is made to take up any shock which may occur from suddenly forcing them up or down, due to ruts or other obstructions which may be encountered on the road. On the Knickerbocker, Decatur, Speedwell, Sampson and a number of others the whole weight of the radiators is held by coiled springs through the center of which rods attached to the frames are passed. Sleeves fastened to the radiators also encircle these frame rods, the springs being interposed between them and the rod ends, thus taking up both the downward and upward thrust.

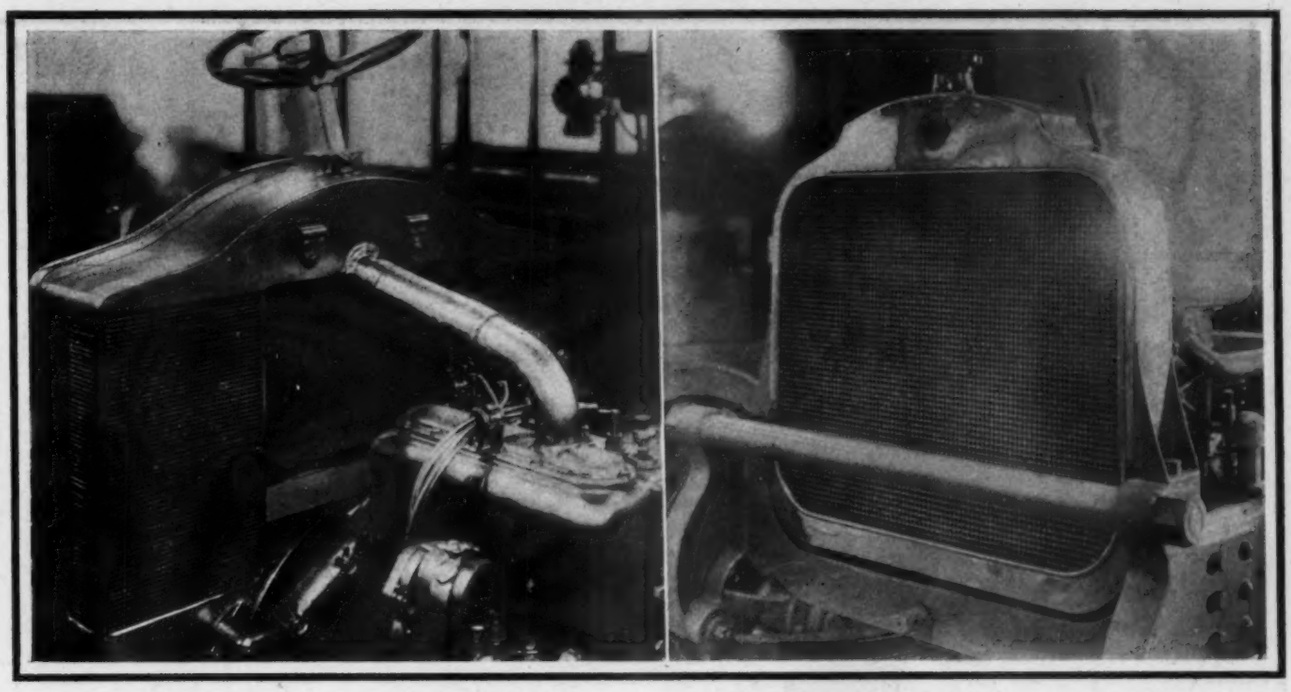
Housings of various forms are placed over the drive chains to protect them from mud and dirt. The usual form is a complete case which fits over both the driving sprocket on the jackshaft and the larger one mounted on the rear axle. The Knox housing is hinged at the smaller end and is made so as to come apart lengthwise for quick removal. The jackshaft cap and grease cup are not inclosed, the housing being placed back of them. A small sliding door is located just in front of the wheel rim, permitting the chain to be reached without removing the entire cover. The gears and connecting chain which are used for elevating the Morgan dump body are inclosed by an oval-shaped substantial wire-mesh cover for protecting the operator. On the Mack 7-ton model the jackshaft driving pinions are enclosed in sheet-metal cases which are riveted to the front of the rear mudguards, thus making them practically integral with the latter. This makes for a very rigid construction and precludes



Mack integral chain housing and mud-guard

The Morgan chain and gear protector

Sampson compressed air lifting device. Controller on dash



Wide rear radiator on the Lippard-Stewart models

Substantial construction of Walter radiator protecting rod

any possibility of their jarring loose. A number of other machines are equipped with chain housings.

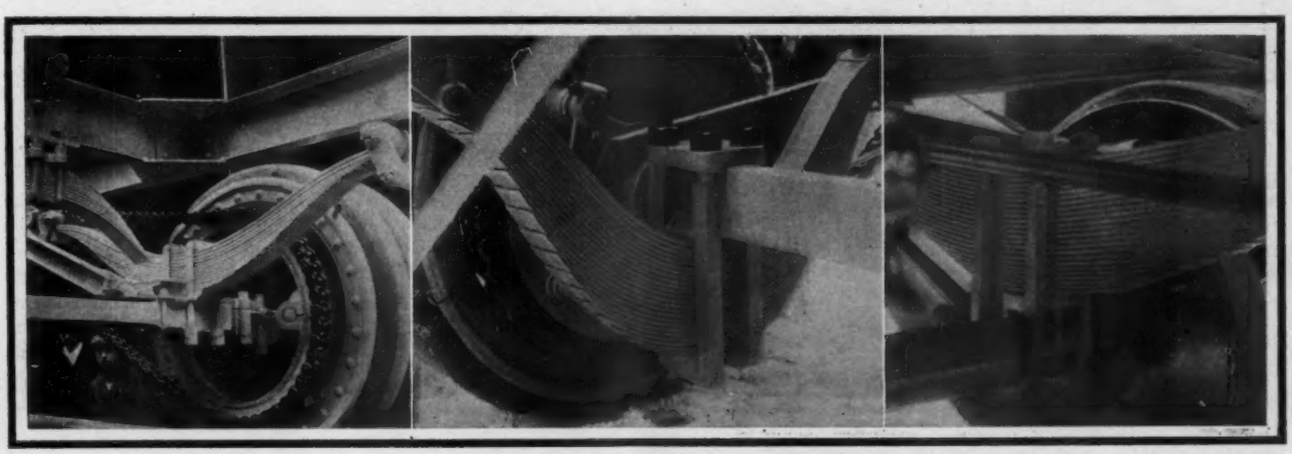
For the protection of radiators bumpers of several types have been added. On the Packard truck the front of the frame has been extended about 6 inches out in front of the radiator, making it the farthest forward part of the machine. This not only protects the radiator, but the front springs, wheels and axle as well. A bar lighter than the side frame members is bolted to each of them and extends across in front of the radiator on the McIntyre model. The Decatur bumper is of circular section and extends out in front of the car to a distance of about 14 inches. It is fastened at either side to the frame in a socket, these being cast integral with the front of the frame members where the springs are fastened. A heavy iron bar is bolted across between the side beams in front of the radiator in the Walter construction. Holes for receiving the ends of this bar are cast integrally with and projecting upwards from the front spring brackets, which are riveted to the side-frame pieces. The design presents a very substantial appearance. The White models are also provided with radiator protection in the form of substantial bars extending across the front in the usual way. The Gramm models exhibit a bumper which is riveted to the side-frame members in such a manner that the rivets will give way in the event of a collision and thus save the rest of the frame from damage.

Radiators of many forms are presented. On the Lippard-Stewart cars the radiators are placed in the rear and they are exceedingly wide. Provision is made for their easy removal after the water connections to the engine have been removed. The Morgan trucks have very wide, short affairs of the cellular type, while those of the Speedwell design are the opposite, being narrow and long. Most of the other models have radiators which follow the same general design as those used on the pleasure cars of the same makes.

The Mechanical Horse Coming

In connection with the Knox cars, the Martin tractor is shown. This is a single-wheel motor device that may be attached to the front axle of any heavy four-wheeled vehicle designed to be horse-drawn. The device takes the place of the horse in the true sense of the word. The single front wheel may be turned at an angle of 85 degrees, and the frame which takes the place of the wagon tongue swings to right or left just as it would be swung by horses, enabling the machine to swing a truck in a small radius.

In general, it might be said that this year's array of trucks and commercial vehicles presents a strictly businesslike and substantial appearance; they are examples of accessibility and the commercial world is thoroughly awake to their possibilities.



Speedwell rear suspension

Hewitt 10-ton heavy underslung spring

Knox rear spring and chain housing

Opinions on Truck Utility

By Ed. W. Curtis, Jr.
Member S.A.E.

Five-ton coal truck transporting fuel to power station in a lumber district

WITH the constantly increasing sale of motor trucks the demand for auxiliary loading and unloading devices has developed a variety of contrivances, good, bad and indifferent, which are to be obtained readily all over the country. Expert discrimination, however, is generally required to correctly select and adapt the proper device to the work in hand.

As long as the horse held undisputed sway, auxiliary loading or unloading devices were looked upon merely as labor-saving helps and the consequent economy was only subconsciously considered. The hand winch, crane, grab bucket and hand truck were frequently found where the teamster or terminal was sufficiently wealthy to afford them, but were always looked upon more or less as luxuries. Such devices, however, reduced the manual labor and increased the availability of the truck, particularly in coal yards, stone yards, quarries and building excavations. In the last-mentioned case it was not unusual to see teams driven into an excavation, loaded, and with more or less difficulty assisted out of the hole. In recent years, however, the teams generally load on the street at a chute or hopper, the material being elevated by means of a grab bucket or car and derrick. Most of the saving effected by this change of method is in manual labor, as at best the horse can do little more than under the older plan.

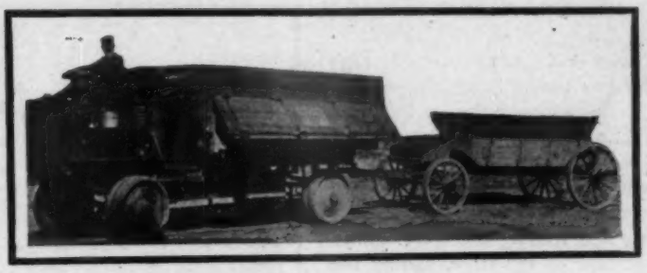
Singular as it may appear and contrary to horse practice, the great majority of motor-truck owners commence tabulating the performance of their trucks from the day they enter service. Mileage is the average man's unit for performance, and this in the motor truck, especially the gasoline truck, on account of its high speed, is so far beyond the horse performance that he is highly pleased with the results. Eventually he begins to accumulate operating costs; later his maintenance expense comes to his notice; and in some cases we know that the owner has persuaded himself that the motor truck is not only uneconomical, but extravagant, and consigns it and his investment to eternal damnation without giving it a fair trial by a competent jury.

Packard 3-ton truck with nest body ready to be fitted into it

This is not the broad-minded business man, accustomed to working out the hard problems of business. The average business man discovering such a situation would first investigate the conditions himself and then call in the manufacturer of the machine for a proper solution of the trouble. Such a conference usually develops either excessive speed, supposedly demanded of the truck to show economy, or long periods of idle time, or both. In many cases the transportation engineer would straighten this out by rearranging the delivery service to conform to motor truck practice, re-routing, introducing necessary schedule changes, and possibly some auxiliary means of loading and unloading to reduce the standing time of the truck to a minimum. When the last named is determined upon, a careful analysis of the operating conditions becomes necessary to properly determine what best to recommend.

Numerous devices are in common use throughout the country, and the following are likely to be found in any of the large cities: For loading—the hopper, chute, pocket, grab bucket, crane, hand truck, portable cage and winch. For unloading—dumping body, chute crane, hand truck, portable cage and winch. There are many modifications of all of these.

DUMPING BODIES—Great variety exists in dumping bodies, and there is good reason for this. Hard coal, for instance, can readily be dumped at an angle of 15 degrees, while soft coal (particularly if it has been carried any distance over rough pavements and had opportunity to pack) requires an angle of at least 45 degrees. The same conditions apply to gravel, dirt, sand, snow, etc. This accounts in large measure for the variety of dump bodies.



Side-dumping body fitted to 10-ton heavy-duty truck

There is, however, another consideration which is important, i.e., ability to manipulate a motor truck in narrow alleys or congested places. This condition must indicate whether a side or end-dump is required, whether the body must be elevated and dumped, or whether it may be tilted. The hopper body is hardly permissible on the gasoline chassis, but can be adapted easily to the electric chassis by arranging the battery forward and back of the hopper bottom.

There are so many well-developed dumping bodies made by wagon manufacturers who specialize on this work that a great variety of bodies may be obtained, independent of the chassis manufacturer, at very small cost.

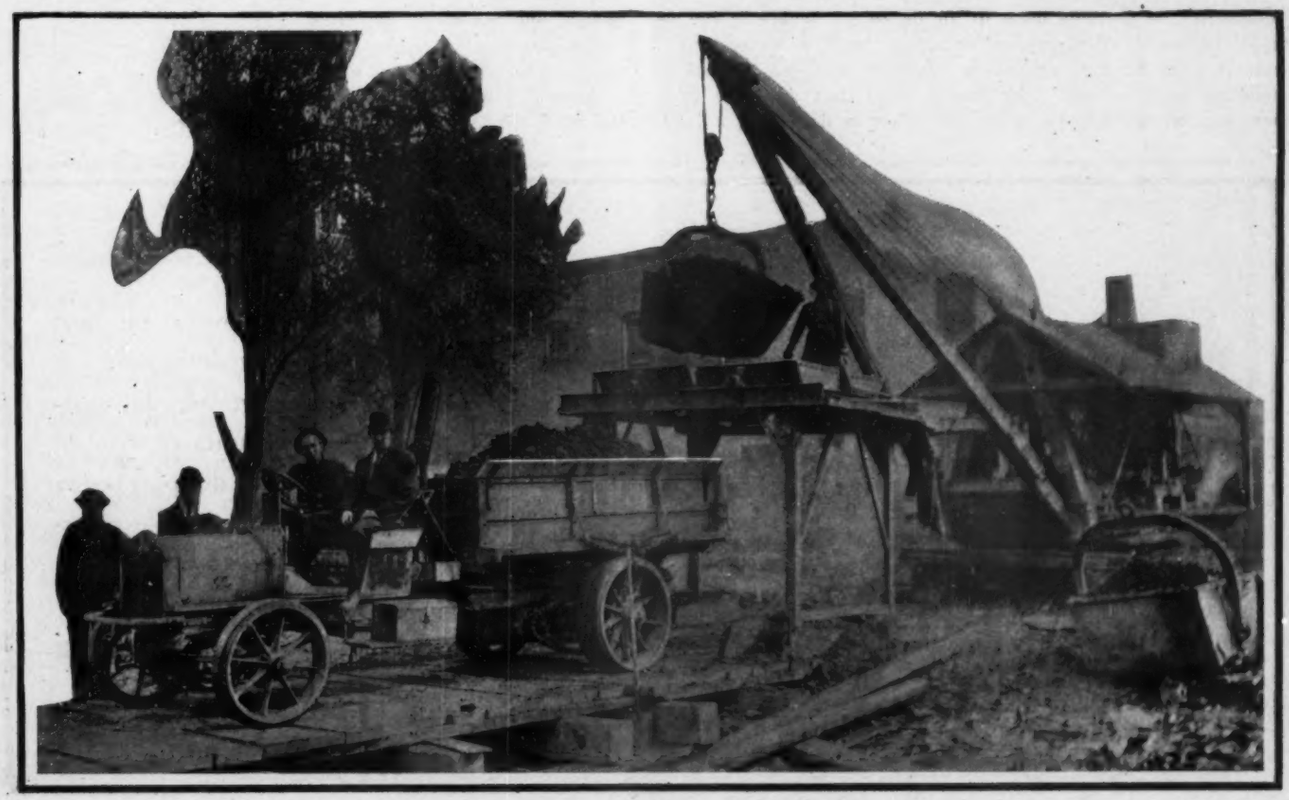
Practically every coal yard handling hard coal is equipped with coal pockets so that loading is speedily accomplished. Where soft coal is handled it is seldom possible to load the truck by this method, although the chute is in use in some places. The usual method is to shovel the coal out of a car into the truck or shovel it off the ground into the truck. The driver is expected to do this, and at times gets assistance from a fellow-driver, but is usually required to repay this obligation in kind. This limits the operation of the truck to the capacity of the man, which is one of the factors in connection with motor truck operation that frequently spells failure for the truck.

A portable electric jib crane with a grab bucket has been especially designed to overcome this condition, and it is estimated that its operation will permit the motor truck to do three times the work it can do under present conditions. Nearly every sand-pit or pier is equipped with a grab bucket of some kind; the loading being either directly into the truck or through a large hopper, from which the truck is loaded. This same condition applies to gravel, broken stone, etc. All of the above methods of loading contemplate some form of dumping body to accomplish quick unloading.

QUICK-LOADING HOPPER—There is one other method of quick loading that is not widely known, but serves its purpose very well. It contemplates a device made by the Quick Loading Device Company, consisting of a steel hopper which can be hung over the side of a gondola car. Men constantly shoveling into this permits the truck to run under it, dump it, and pull away. As many as six of these can be used on the side of a car and keep a pretty good fleet of trucks moving.

JIB CRANE—The crane has long been used for loading heavy materials, but now comes into use in smaller form for handling general merchandise from the ground to the truck and back to ground or platform. This contemplates the small jib crane mounted on the truck. Very little power is required to operate this, as the lift is usually short and the speed slow.

PORTABLE ELECTRIC CRANE—The portable electric crane fills a long-felt want in the handling of merchandise by motor trucks. Many of the commodities which are put up to the power wagon today are heavy, bulky and awkward to handle. Much time is consumed in getting these on and off the truck. The portable electric crane does this work with ease and dispatch, the saving in labor varying from two to eight men. This device gives the advantage of placing the load exactly where



White 3-ton coal vehicle being loaded by means of steam-driven hoist and dumping bucket

it is wanted, and no further movement is necessary until the next operation.

CAGE OR RACK—Some use has been made of the portable cage or rack, but it has not been adopted as generally as it should be. In most cases where it is in use the actuating influence has been some insurance regulation prohibiting gasoline trucks inside a building, or some such equally non-commercial reason.

In the case of the department store, for instance, that is compelled to load its wagons at the store, much valuable time might be saved by loading, listing and routing the merchandise in a rack of this kind in the basement of the store, sliding the whole load into the wagon as soon as it comes up to the street.

The adaptability of this device in the case of the laundry, grocery, market, dyeing and cleaning establishments, printing houses and dozens of other lines would very materially increase the serviceability of the truck.

HAND TRUCKS—Similar economies may be obtained by the use of various kinds of warehouse and factory hand trucks, having these loaded in advance of the arrival of the motor truck and immediately pushed aboard. In this way a 5-ton load of miscellaneous merchandise is put on the truck by a large Chicago house in not to exceed five minutes, while putting on piece by piece would consume thirty to forty-five minutes. The same economy obtains in unloading if the shipping clerk has used any discretion in packing the small trucks.

WINCH—We must not overlook the winch, either hand or power-driven, the latter preferably, because it is much quicker and cheaper, as in pulling a heavy load the hand winch requires two men, and sometimes more. The safe mover is a good example of this, the power winch on whose truck is also used as a hoist. For loading and unloading heavy and awkward loads the power winch is indispensable. Cases of 700 pounds to 1,000 pounds can be handled well by two men, whereas without the winch five to six men would be required. Another point: A motor truck equipped with a power winch need never be stuck in the mud, as the operator can make fast to a convenient tree and pull himself out with the winch.

SUMMARY—It is a question whether the greater saving is to be accomplished on the loading or unloading end. In my judgment, the portable body in all its forms, where it can be used, represents the greatest economy for the motor truck. Men in many lines of business are familiar with this method of handling merchandise. The lumber yard uses duplicate lumber wagons, one loading while the other is delivering a load.

Gramm 3-ton coal truck with dumping body in place

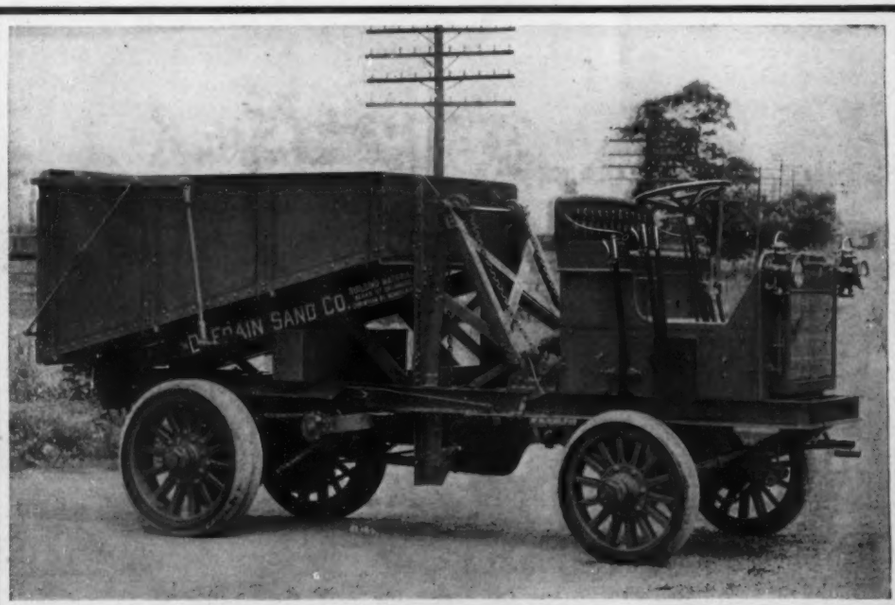
Some coal companies follow this practice; and here and there we find similar adaptations of the idea. The closer to continuous operation, the greater the efficiency.

Not infrequently, when a carefully worked out plan of operation, contemplating the use of auxiliary loading or unloading devices, is submitted to a prospective purchaser, showing the possibilities of the motor truck, he radiates an entirely new idea, all his own, to the effect that he can do this same thing with his horse equipment. But there he is wrong. The horse cannot work continuously; he must have his periods of rest. lengthy loading and unloading give him just that opportunity. Moreover, the horse driver also needs his rest periods; he gets these while the horse is working. But the motor truck does not need the rest; and the driver, through the advent of quick loading and unloading devices, does not do as much work, and consequently does not need the same rest periods. The merchant will learn these points if he attempts to apply motor truck methods to horse equipment.

Next to the portable body the jib crane represents the greatest utility, and it is remarkable that we do not see it in general use. The cost is trifling, the power consumed not of consequence, and the utility unlimited.

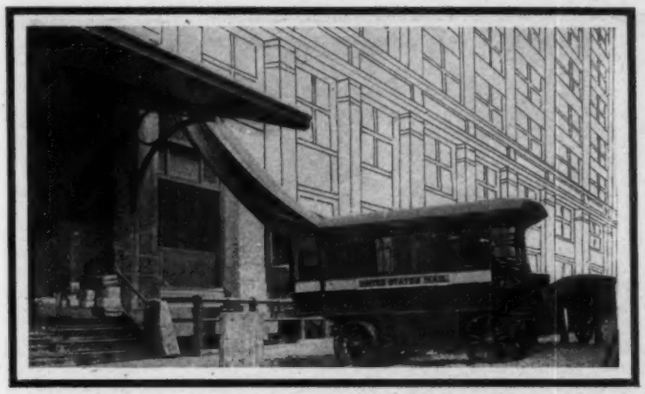
The dumping or tilting body will always be with us in as many forms as we have it today, or more.

When the use of auxiliary loading or unloading devices is indicated, we usually find an individual problem to solve. After



When trucks are used for transporting sand, soft coal, gravel, dirt, garbage, ashes or crushed stone the dumping bodies must be capable of assuming an angle of at least 45 degrees. Otherwise the material does not unload well.

View of a heavy truck with dumping body for transporting sand



Chute-loading a U. S. mail truck at the Times Square office in New York

determining the best contrivance for the commodity to be handled, it frequently becomes necessary to not only install this new machine, but also to rearrange or educate the departments affected in order to accomplish the purpose intended. This must be accepted as a legitimate part of the work of the transportation engineer, and the success of the whole can be guaranteed only in this way. Careful study of the application of auxiliary loading and unloading devices will develop a quick perception of their utility. To get the best results the individual work characteristics should be considered thoroughly by the transportation engineer; and after determining the best device for the particular case, great care should be exercised to assure its proper application by those who handle it. Otherwise the economy predicted may never obtain. It will be well to take into consideration the maximum daily ability of the driver, in order to determine an economical day's work for the truck.

The employment of new devices or new uses for them will unquestionably increase the utility and sale of motor trucks, and should be given all the publicity possible. There is an excellent opportunity for the ingenious engineer who will devise new means of loading or unloading motor truck merchandise. He should have in mind that the power plant of the truck may be utilized to good advantage; also that it is usually desirable to restrict the truck crew to one man, as the economy of the motor truck depends largely upon the saving effected in payroll. As in some other branches of the business, a freer distribution of knowledge would help the cause greatly, and is to be recommended.

Boston Show Bigger than Ever

BOSTON, MASS., Jan. 15—Following the big shows in New York, the two exhibitions booked for Mechanics' Building, Boston, promise to surpass anything ever held in this city. The pleasure car show will be held during the week of March 2-9, while the truck show will open on March 13 to run until March 20. The pleasure exhibition will have all the latest models and many novelties will be shown. The new self-starting devices with which many of the up-to-date cars will be equipped will prove an interesting feature. Many new and handsome body designs will be shown with beautiful upholstery and striking colors. While there will be the usual number of high-priced cars, this year will see a large line of low and moderate-priced automobiles.

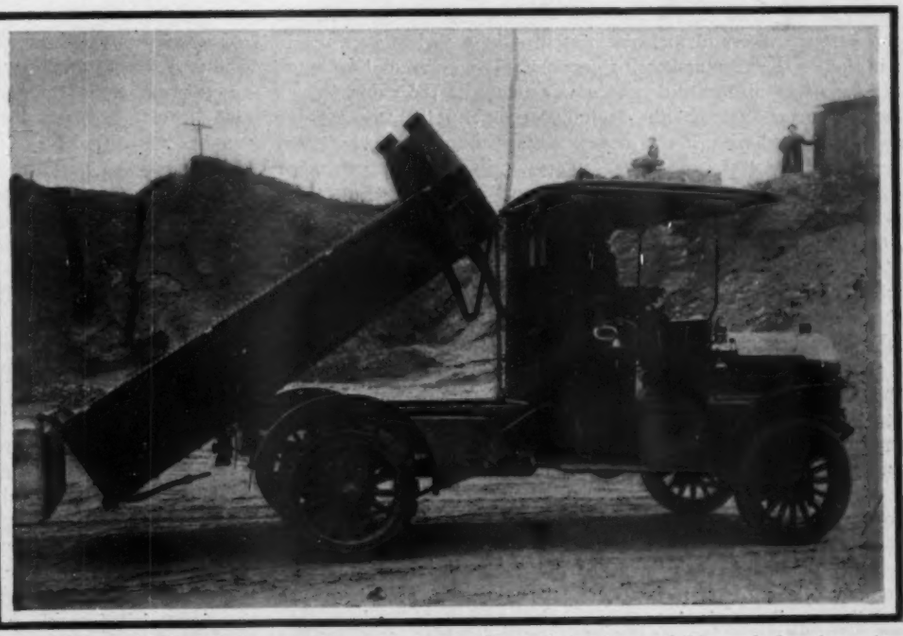
The truck show, which this year will be a separate institution, having formerly been held in connection with the pleasure car show, promises to claim its full share of interest. Tremendous progress has marked the development of the commercial vehicle and there will be found on exhibition wagons and trucks suited to all uses from the light and attractive delivery wagon to the monster 5-ton truck. Interchangeable bodies, dumping scows, coal wagons, lumber vehicles, emergency outfits, hearses, fire apparatus, which range from the light hose-wagon to the heavy ladder-truck, and ambulances will be among some of the interesting motor vehicles shown.

The pleasure car show, which is always the society event in Boston, will have the usual attractive features of the past. It will be under the auspices of the Boston Automobile Dealers' Association, while the truck exhibit will be under the direction of the Boston Commercial Motor Vehicle Association. Both exhibitions will be under the personal management of Chester I. Campbell.

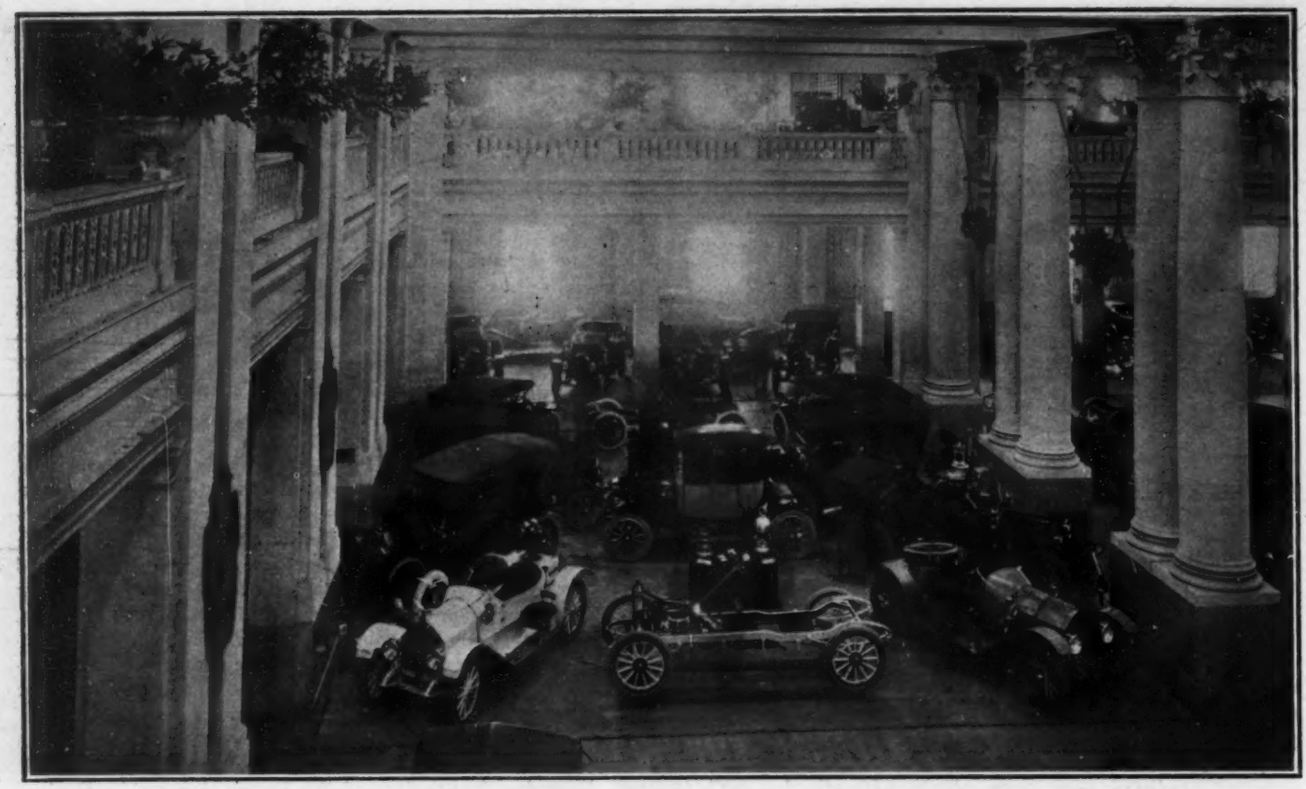
Casualty Figures of New York Racing

SYRACUSE, N. Y., Jan. 15—Figures just made public show that automobile racing at the 1911 State Fair here cost the state almost twice as much as in any previous year. A grim portion of this was $3,802 spent for hospital and funeral bills for those hurt in the accident precipitated by a bursted tire.

There is great variety in the shape and design of dumping bodies for commercial vehicles. In the picture to the right a dumping body, capable of assuming an angle of 45 degrees, has been cleverly mounted on a chassis with comparatively short wheelbase.



Heavy truck with dumping body overhanging the chassis, illustrating the act of unloading



Looking down on the Palace pleasure car exhibits in the Colonnade gallery

Palace Show Was a Business Affair—

Despite the Difference in Price the Cars Equaled Those at the Garden in the Matter of Body Design

A CAREFUL canvass of the thirty-four exhibits of gasoline pleasure cars at the New Grand Central Palace indicates that the show which closed last night was one of the most successful business exhibitions ever held under the auspices of the National Association of Automobile Manufacturers. The New Palace afforded ample space not only for the thirty-four makers of pleasure cars to exhibit their wares, but in addition to as many makers of commercial vehicles, and although the list of exhibitors did not contain many of the names which have been associated with the industry since it became a force to be reckoned with, it was nevertheless made up of an excellent representative class of makers, varying in the scale of merit over practically as wide a range, or nearly so, as the line-up of pleasure car exhibitors at the Garden Show which ended last Saturday night.

While the majority of the exhibits were those of makers whose names have been added to the roll of the industry within the last four years, side by side with them were other concerns who have been in the industry for a great many years.

A glance over the exhibits of touring cars showed that twenty-five of them are located on the main floor, some occupying the central court of honor, the others flanking the walls on its four sides. All told there were shown twenty-six chassis and 112 cars of different types, the majority being touring cars, roadsters, a few limousines and several Colonial types of coupés. While the number of limousine types exhibited was not as large compared with the total number of exhibitors as was seen at the Garden, this was hardly to be expected with the younger class of manufacturers, the majority of whom are building medium-priced cars.

A study of the exhibits at the Palace gives an excellent idea of what the maker of medium-priced cars who has been in the industry but a comparatively few years is doing. One fact which is most apparent is that the cars are the equal of those seen at the Garden so far as lines of body design are concerned. This applies not only to the touring car and the roadster types, but to the coupé types and the single-compartment bodies as well. Of these latter two or three showed really excellent lines, notably the Rambler and Cole. A couple of years ago there was a marked difference in body styles between the high-priced and medium-priced cars, but this variance is entirely missing today, and it is safe to say that the body lines give little indication of the money expended in the chassis, because there were many examples both at the Palace and at the Garden of cars appearing of equal value externally, but with chassis differing as much as $1,000 in price.

Although the twenty-six different chassis shown at the Palace are exemplars of modern construction—in fact, some of them may be considered leaders in their respective spheres—from a standpoint of chassis exhibits there is scarcely as much variety seen at the Garden. The Abbott-Detroit and Fiat factories were the only concerns that exhibited two chassis, the former showing both the 30 and the 44 models, while the Fiat was represented by its four- and six-cylinder types. Ten of the exhibiting concerns failed to show chassis of any type, but the majority had individual exhibits of motors, gearsets or axle parts.

View across the Colonnade on the main floor of the Palace

A Study of the 34 Makes Exhibited

Self-Starters, Electric-Lighting, Left-Hand Control and Monobloc Motors Numerous, Six-Cylinder Types Few

As to novelties, one of the most interesting cars at the show was the Abbott-Detroit submarine gunboat, which is a runabout type with a metal body, the rivets securing the different portions showing as in a modern steel Pullman car. The body is given a rakish appearance by the V-shaped radiator, which is quite a novelty on American cars, but one which has a considerable following abroad. This body is fitted to the 44 chassis.

In studying the Colonial coupés one feature which proved attractive is the folding seat which hinges to the right front of the dash, where the steering wheel is mounted on the left side. This gives the coupé a three-passenger capacity and makes it an ideal winter vehicle.

In the standard touring car design the greatest novelty in evidence was the eight-passenger Schacht, which has the standard front seat and rear tonneau seat, and in addition a full-width tonneau seat the back of which is against the front seat so that the passengers ride facing the rear, as in the ancient dos-a-dos, a type of design common in horse-vehicle construction. A further feature of the body is a lifting windshield between the two seats which back each other. When this is raised it forms a partition between what is known as the tonneau compartment and that for the front seat.

As to the self-starter feature, a canvass of the thirty-four exhibitors evidenced the surprising fact that but one concern failed to include that device either as standard or optional equipment. More than half of the exhibitors stated frankly that they had not yet decided on the make they would fit as standard; that was still an unsettled question, but they stated that they would fit for the necessary price any make of starter which the buyer desired. The same condition also obtains to a certain extent in electric lighting. One company announced its readiness to fit both self-starter and electric lighting outfits for $85 above the standard price. At another stand where self-starters were not shown fitted to any models exhibited, it was stated that a choice of any make would be given, the price ranging from $20 to $175. Where self-starters were shown in place on the cars they were in the majority of cases of the explosive gas type. A few compressed-air styles were also shown. The price of car which predominated at the Palace was that in which there is much rivalry in sales, and when the self-starter craze took hold of the country, nearly all of the makers who exhibited there were compelled to give practically any option in the matter of self-starters.

In the matter of electric lighting the spirit of the times was not so evident. There were perhaps ten different firms showing electric generators of one make or another fitted to the motor. The majority of these were located in hurriedly improvised positions on the motor and gave evidence of not having been taken into consideration when the original crankcase design was brought out. In the majority of them the generator was mounted over the magneto and was driven by chain from the magneto shaft. While this method makes the generator very accessible, it practically eliminates everything in the way of accessibility from the motor. The Velie designers have placed the generator on the opposite side of the motor and have so designed the crankcase as to provide inclosed chain drive.

Appearance of the south aisle on the main floor of the Palace

Looking at the more standard parts of the cars exhibited, one was surprised at the few makes of six-cylinder cars shown, the only exponents being Fiat, Kline, Auburn, McFarlan and Havers. The Fiat was the only one on exhibition which used the bloc casting. On the Klinekar use is made of the continuous water jacket, the different cylinder castings having their adjacent faces cut away, exposing the interior of the water jacket. When the motor is assembled these faces are bolted together, giving a continuous water space from the front to the rear cylinder. On the McFarlan and Havers sixes the cylinders are cast in pairs. On the Auburn they are cast separately.

The foredoor design was so general among the cars at the Palace that it is safe to say that that type of body has become standard. There was not a single example in evidence of a touring car minus the foredoor body. While there were three or four examples of roadsters without the foredoor these designs were in several cases models carried over from last year. The standard roadster has become a most attractive vehicle. It was back in 1910 that the Cutting roadster with its foredoor body was first seen, and it has remained until the present in much the same style, having those particular features now so frequently seen in roadsters, namely, seats well in advance of the rear axle, and room on the rear deck for gas tank and baggage trunk.

Left-Hand Control Adopted by Many

There were many concerns which have adopted left-hand control. Some place the steering wheel on the left side, but have the levers in the center; and there are many which mount the wheel on the right and leave the levers in the center. Others allow their patrons a choice of styles, having both steering wheel and levers on the right and left side. Among those showing left-hand control were: Krit, steering wheel on the left and levers at left; McFarlan, wheel on right and levers in center; Otto, some models with left-hand wheel and center levers and others with right-hand wheel and levers; R. C. H., left-hand wheel with center levers on all models; Imperial, right-hand wheel with center levers; Paterson, left-hand wheel with center levers and right-hand wheel with right-hand levers; Herreshoff, left-hand wheel and single lever in center on all; Hupmobile, new model with right-hand wheel and center lever; DeTamble, right-hand wheel with center lever; King, left-hand wheel with single lever in center; Schacht, steering wheel on left or right side, with lever in center; Stuyvesant, left-hand wheel with center lever; Michigan, right-hand wheel with central lever. The right-hand steering wheel with both change speed and emergency brake levers on the right-hand side are used on all other models. In nearly every case where the levers are kept on the right they are placed inside of the body, but there were a few examples in evidence where the levers are left outside of the body on 1911 types which are being carried over.

The use of elliptic springs is slightly on the increase. The Krit uses them in the rear and attaches the spring beneath the axle, thereby giving a lower support to the body. The springs are also considerably tilted. The Middleby company, which has been associated with air-cooled cars up to the present time, showed nothing but a monobloc four-cylinder water-cooled type. In the chassis elliptic springs are used in front and rear, both sets being mounted on the axle. The Paige-Detroit company uses a single transverse semi-elliptic spring, supported in rear of the axle, on all its cars. The spring rests on a shoulder on the differential housing and at its upper end anchors to the cross member of the frame. The King cars use the patented King type of semi-elliptic rear springs. It is scarcely correct, however, to call it a semi-elliptic type, the rear end of the spring being attached to a swinging shackle over the rear axle. The front end is fixed to the frame and the strain at a point one-third from the forward end also anchors to the frame side member. This gives two points of attachment to the frame. Although the Ford was not exhibited either at the Palace or the Garden it rightfully deserves a place in spring mention in that it uses both front and rear transverse semi-elliptic springs.

The monobloc motor was everywhere in evidence—and the same may be said of the unit power plant. In fact, these two characteristics were less general at the Garden than they were at the Palace. The King was one example noticed in which the upper part of the crankcase is integral with the cylinder castings. The Regal also has a model of this type. In the Garden show of last week the Everitt was the only type of car using this construction. The Krit follows its customary bloc scheme in all of its models. The Middleby uses bloc design and is one of the few to employ a T-head casting. The new R. C. H. has been described already in THE AUTOMOBILE. On the new Hupmobile an interesting feature of the bloc unit power construction is mounting a magneto in rear of the fourth cylinder. It rests on the flywheel casting and is driven by silent chain. The Imperial uses a unit power plant, but employs cylinders cast in pairs. This story of unit and bloc construction could be carried on throughout the entire show, but the majority of concerns employing these designs have already been mentioned.

The only example of underslung frame on exhibition was the Regal, whose position corresponds with that occupied by the different American underslung models at the recent Garden show. The Regal company is at present manufacturing three underslung types and two with the ordinary frame. This concern is also building motors with bloc castings on three types and with cylinders cast in pairs on two models. Right-hand steering wheel and levers are used throughout.

One of the greatest points of interest was the baggage-carrying facilities. On most runabouts the trunk on the rear deck is fitted, while on touring cars much use is being made of compartments on the running board. An example of this is the Warren-Detroit, which combines four compartments on the outside running board. These extend the entire length of the running board. There are two shallow compartments, one at each end, and one of approximately double height in the middle, the center one containing the battery. Snugly placed between these compartments and the side of the body is a Prest-O-Lite tank. It is hidden to a large extent and has a cylindrical extension which covers the valve portion of the tank. On the DeTamble, between the running board and the frame, is a tool space nearly the entire length of the running board. It offers room for the battery and tire tools, as well as space for auxiliary oil cans if needed. This is a specially satisfactory place for these tools as they are accessible without disturbing the tonneau passengers. On the McFarlan bodies is a transverse baggage compartment of cylindrical shape and located beneath the rear of the chassis. At first view it resembles a gasoline tank. It serves admirably for carrying storm curtains, extra rugs, tire pump, jack, etc.

The Otto company exhibited a roadster model in which a special effort has been made to provide adequate baggage facilities. There is a big baggage trunk on the rear deck, while back of this is space for two extra cases, and fitting inside of the casings is a cylindrical box in which tools, inner tubes, etc., may be kept. On the Abbott-Detroit gunboat design known as the submarine facilities are provided in the rear part of the body for carrying tools and many other necessary parts.

Much better facilities for brake connections were in evidence at the Palace. An example of this is the Lion chassis in which particularly short and simple equalizers are used. In length these equalizers are not more than one-third of the distance between the side members of the frame. Being short, it is possible to house all brake connections inside the frame members.

The Abbott-Detroit showed the greatest number of vehicles, exhibiting seven body types and two chassis. The Bergdoll had a very extensive exhibit on the balcony, showing three complete cars and a chassis. Right-hand steering wheel and levers are used on all of these.

The exhibitors of gasoline pleasure cars at the Palace were as follows: Krit, Middleby, McFarlan, Otto, R. C. H., Paige-Detroit, Cutting, Imperial, Velie, Paterson, Hereshoff, Penn, Abbott-Detroit, Warren-Detroit, Lion, Stutz, Hupmobile, Cole, Rambler, Kline, Auburn, DeTamble, Regal, Fiat, Westcott, King, Pathfinder, Schacht, Stuyvesant, Bergdoll, Metz, Michigan, Havers and Great Western. The exhibitors of electric vehicles included the Argo, Hupp and Ohio.

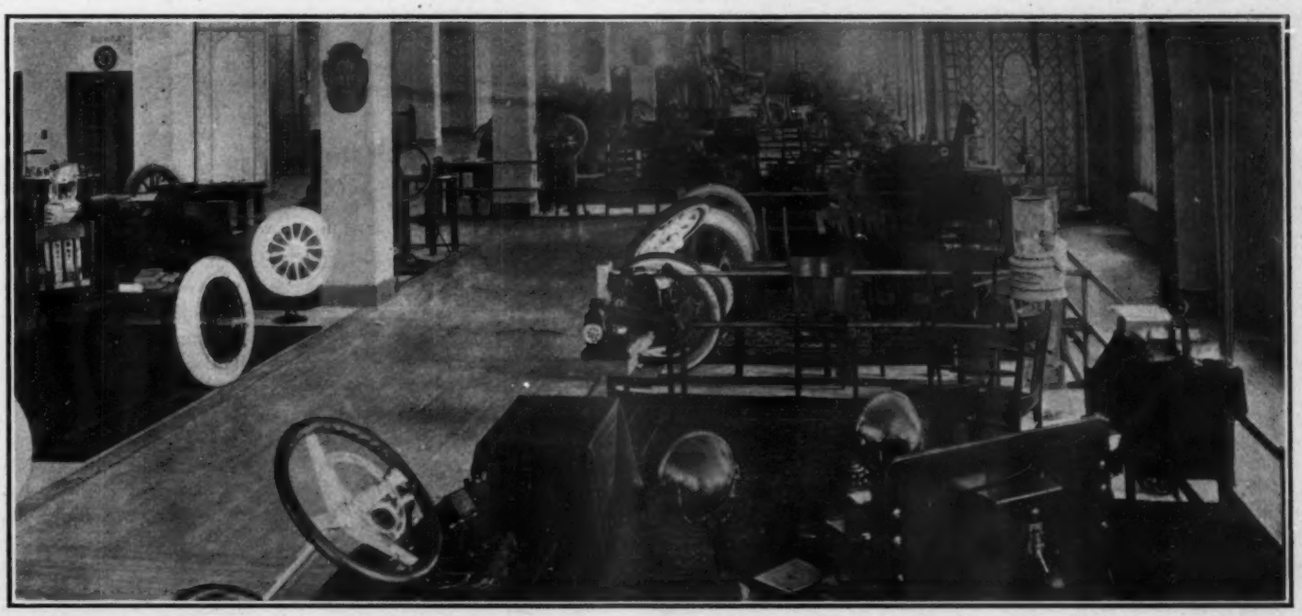
Pleasure Week Figures Break Record

According to Secretary M. L. Downs, of the Madison Square Garden show committee, the attendance during the exhibition of pleasure cars which closed Saturday night, established a new high-water mark in two particulars. In the first place the total attendance was 146,812, although exact figures were not given out officially. The paid attendance was also greater than ever before; but the exact figures are not available.

Starting January 6 in a blizzard, the attendance opening night was not quite up to the mark of 1911. On Monday it was about 2,000 over last year. Tuesday was only 800 larger, but on Wednesday the building accommodated the largest automobile crowd in its history. It is said that the total figures ran up to 27,000, or more than 7,000 ahead of 1911. The last three days exceeded in attendance the corresponding days of last year's show by about 2,000 each day. This makes the attendance of 1912 15,000 more than last year.

Dividing the show into thirteen sessions, this would make the average attendance at each session 11,447, or 22,894 each full day. Including the season press badges, of which no record was made at the gates, the total attendance was not far from 24,000 a day.

While the Garden shows for several years have not been primarily for retail business or the establishment of agencies, the show this year proved an eye-opener in these particulars. Two companies that are rated within the leading score of makers of pleasure automobiles have reported that they have respectively done twice and five times the amount of business ever done before by them at Madison Square Garden shows. Several others declare that they equaled the figures of their previous best show and only three companies acknowledged that they did less business than last year.



The accessory displays were well located, with plenty of room and light

S.A.E. Standards Committee Meets

FOR THE PURPOSE of formulating the report to be made to the annual meeting of the Society of Automobile Engineers this week, the general Standards Committee of the society met Tuesday and heard preliminary reports of the various divisions. There were sixteen divisions scheduled to appear before the committee as follows:

Aluminum and Copper Alloys Division—Chairman, Barr. The formal report was not presented but a letter from the chairman was received, recommending that alloy number 30 be changed. The recommendation was received and it was voted to adopt it as part of the report.

Bearings Division—No report.

Broaches Division—C. W. Spicer acting chairman: There was some debate over the acceptance of Mr. Spicer's reference to multiple splines on shafts. The chairman asked to know something of the attitude of the committee as to whether the outside of the shaft or the sides of the holes should be finished. There was an effort made to eliminate that part of the reference from the report but the committee voted to submit it.

Carbureter Division—C. W. Stiger, acting chairman: This report does not contemplate any recommendations about the carbureters themselves but will treat of standardization of brackets, hangings and other fittings. Mr. Stiger stated that the report is incomplete but will be ready for presentation.

Frames Sections Division—J. G. Perrin, chairman: This report will be reduced to cover only three or four heads as follows: Chemical composition, height of section, size of tapered end and drop design.

Iron and Steel Division—Henry Souther, chairman: The printed report as submitted was recommended.

Lock Washers Division—J. E. Wilson, chairman: Nothing new developed, with regard to this division, differing in any material way from the last report submitted.

Miscellaneous Division—A. L. Riker, chairman: There were seven subjects under this head. The first as to fusible plugs for gasoline tanks provoked a lively debate. It appears that the municipal authorities of New York contemplated passing an ordinance providing for the insertion of fusible plugs in gasoline tanks and for the draining of such tanks before entering any garage. The committee would not accept any such suggestion and the division in charge of that subject recommended that a safety valve be provided for the top of pressure tanks, gauged to one-tenth of the bursting strength of the tank, and for a vent in the gravity system. This will be presented to the society. A series of magneto dimensions was recommended which is of sufficient breadth to take in most of the standard makes. The committee on electric lighting outfits was asked to reconsider its report as it was deemed incomplete. Action was deferred on the matter of spark plug tread tolerances. The report of a standard gauge for all kinds of cars was tabled in committee and was not presented. With regard to oversize cylinders, the division covering that subject recommended that two grindings be provided in the standardization, allowing .02 and .04 enlargement of the diameters respectively for the first and the second. The division on bushed rods and yoke ends reported favorably toward including a bushing in standard joints as an option.

Seamless Steel Tubes Division—H. W. Alden, chairman: No changes recommended in the lists.

Sheet Metals Division—T. V. Buckwalter, chairman; Printed report presented.

Truck Standards Division—W. P. Kennedy, chairman: This division reported that it had agreed on a method of procedure but made no report.

Springs Division—A. C. Bergman, chairman: Printed report submitted.

Wheel Dimensions and Fastenings for Tires Division—W. P. Kennedy, chairman: Report later.

Motor Standardization: Tabled.

Hub Cap Standardization: Will be submitted to Miscellaneous Division.

S. A. E. Screw Thread Tolerance: Not presented.

Those present at the session included the following: Henry Souther, Coker F. Clarkson, J. G. Perrin, J. N. LaPointe, R. R. LaPointe, C. W. Spicer, D. F. Graham, C. W. Stiger, J. J. Hull, V. W. Kleisrath, W. P. Kennedy, Henry Hess, A. L. Riker, M. A. Hall, T. V. Buckwalter, D. R. Webster, H. A. Bugie, J. E. Wilson, C. L. Schwartz, E. F. Lake, G. L. Norris, Thomas Towne and S. V. Hunnings.

Informal Meeting E. A. M. A.

AT the Waldorf-Astoria on Thursday the Electric Automobile Manufacturers' Association held its first general meeting since organization in Cleveland in September last. This body, which is composed exclusively of makers of electric pleasure cars, is entirely different from the Electric Vehicle Association of America, has twelve members at present, as follows: Argo Electric Vehicle Company, Saginaw, Mich.; Anderson Electric Car Company, Detroit, Mich.; Babcock Electric Carriage Company, Buffalo, N. Y.; Baker Motor Vehicle Company, Cleveland, Ohio; Borland-Grannis Company, Chicago, Ill.; Broc Electric Vehicle Company, Cleveland, O.; Columbus Buggy Company, Columbus, O.; Ohio Electric Car Company, Toledo, O.; C. P. Kimball Company, Chicago; Ill.; Rauch & Lang Carriage Company, Cleveland, O.; Waverley Company, Indianapolis, Ind., and Woods Motor Vehicle Company, Chicago, Ill. The officers of the association are: President, L. E. Burr, Woods Motor Vehicle Company; vice-president, R. C. Norton, Baker Motor Vehicle Company; treasurer, C. D. Firestone, Columbus Buggy Company, and secretary F. H. Dodge, Ohio Electric Car Company. The executive committee consists of Messrs. Rice, of the Waverley; Norton, of the Baker; Weber, of the Rauch & Lang; Burr, of the Wood, chairman; and Dodge, of the Ohio, secretary.

The meeting, which was attended by fifteen representatives of the electric pleasure car interests, was informal, its principal object being promotion of acquaintance among the members. Discussion of plans for mutual benefit such as securing better recognition of the electric pleasure car at automobile shows as regards space allottment, and formation of a show committee, constituted the only business features of the meeting. Those present at the meeting were: Messrs. Cooley, Johnson and Rice, Waverley; Dodge and Marx, Ohio; Norton, Baker; Kimball, Kimball; Grannis, Borland-Grannis; Fairgrieve, Anderson; Burr, Wood; Fay, C. L. F. Wieber, and C. L. F. Wieber, Jr., Rauch & Lang.

Meetings of the executive committee are usually held about once a month, the place of meeting being determined by the president of the association. The meeting was a pronounced success in every way.

Knight Tells S. A. E. About His Motor

CHARLES Y. KNIGHT delivered a lecture on the Knight motor Friday evening before the Society of Automobile Engineers at the Engineering Building on West Thirty-ninth street. The lecture was a practical repetition of his explanation of the motor made to the American licensees early last fall. The lecture was illustrated with lantern slides and Mr. Knight showed each mechanical process by diagrams projected on a screen.

There were more than 100 members of the society present and after the lecture was finished they cross-examined Mr. Knight on his invention, asking all told thirty-three questions, most of which were directed toward mechanical details covered in the lecture itself. Mr. Knight made ready answer to most of the questions, laughingly parried several others and flatly avoided a few.

In introducing his subject he traced the various progressive steps of development since 1904, when he built his first sleeve-valve motor, to adoption of the idea by the Daimler company. He retold the story of the tests made under the auspices of the Royal Automobile Club, including a bench test of 132 hours on an overload of 33 1-3 per cent., a 2,000-mile trial on Brooklands track at over 42 miles an hour, and a final bench test of five hours at the factory. Mr. Knight said that prior to all this, the engines tested were run for 300 consecutive hours at the Daimler factory.

He said that his 38-horsepower motor developed 54 horsepower and that the 22-horsepower engine showed over 38 horsepower during the trials. The gasoline consumption was 22 miles to the imperial gallon, while the oil consumption was 1 imperial gallon to 750 miles. This would figure around 18 miles for a standard gallon of gasoline.

William P. Kennedy, of the American Locomotive Company, acted as presiding officer at the meeting.

After illustrating some earlier attempts of constructing an internal-combustion sleeve-valve engine, and pointing out the reasons for their failure, which lay in the impossibility of maintaining adequate lubrication and cooling, as well as gas tightness of the combustion-chamber, Mr. Knight showed, at the head of a number of slides, how these difficulties had been overcome in his design as it now obtains by the arrangement of the junk ring in the cylinder head which takes up the wear of the sleeves as it progresses. He stated that the clearance between the sleeves and the ring respectively could vary between .002 and .01 inch, according to the size and power of the motor, and explained how gas-tightness is maintained by a film of oil rising between the sleeves and originally caused by the oil spray formed by the scoop dipping into the trough in the base-chamber.

He elaborated the ingenious system of increasing the lubrication with the opening of the throttle, by which the motor is always afforded a sufficient quantity of oil without smoking. For instance, when the Knight-Daimler motor rated at 38 horsepower R. A. C. (which rating is identical with that of the S. A. E.) was tested at a speed from 12 to 1,500 revolutions it was found that, although the lower end of the connecting rod was covered to a height of 1 inch with oil, there was no smoke production. The surfaces of the sleeves are lubricated by the oil raised by the vacuum produced on the suction stroke, which, however, is never in excess of 7 pounds, and the lubrication of the sleeves is facilitated by the annular grooves which are cut into the outer surfaces of the sleeves. Diagonal grooves are provided in the upper-sleeve portions to provide an oil way to the cylinder heads. To attain this end, absolute airtightness of the head is necessary, or the vacuum will not be strong enough to lift the oil.

An interesting detail of Mr. Knight's speech was the statement that, after he had perfected his motor according to American standards, he found it unable to stand the great stresses set up in it by the fast travel possible and demanded for work on French or British roads. It took another year to adapt the motor to these new conditions, and after that time it was ready to be exhibited at Olympia. It was shortly thereafter that, prompted by the criticism of the motoring public for its determination of discarding its poppet-valve motor, the Daimler company and Mr. Knight decided to have two types of his motor undergo the abovementioned test before the Royal Automobile Club's technical committee.

The smaller motor, 4 7-8 inches bore by 5 1-8 inches stroke, was rated at 28.9 horsepower, while the larger one, dimensioned 4 7-8 by 5 1-8 inches, had a rating of 38 horsepower. The conditions of the test were that if either motor gave, at any time during the 132 hours of the test, less than 4-3 its R. A. C. rating, the company should have failed to have proved any claims for its motor. But they were not to be blamed for any shortcoming that could be traced to any of the accessories giving out. Twice a day the motor was throttled down to take off the scales. After the bench test had been finished, and the motors tried out on the Brooklands track, they were disassembled and, after having been submitted to the equivalent of a 9,000-mile test, no carbon could be found on the piston heads. In a test which was then made the motor which had first given 54 horsepower gave 57 now, owing to the better fitting of the parts arrived at by the long run of the motors.

In the discussion that followed Mr. Knight stated that the explosion pressure was four times that of the compression, that is 300 pounds approximately. According to the inventor, no effect of the explosion has ever shown upon any sleeves which were more than 3 millimeters thick. As a matter of safety, they are generally made 3.5 to 4 millimeters thick. With a thickness of less than 3 mm., the sleeves are very apt to crack. In reply to the question whether the sleeves had to be ground or not, Mr. Knight stated that the Daimler company refrained from grinding them, and had met with entirely satisfactory work, while the American makers of Knight motors preferred to machine the inside of the sleeves.

Mr. Knight, answering a query, remarked that he had experimented with air cooling, but that he preferred water cooling for his motors; also, that the Atlas Engine Company was contemplating the adaptation of his motors for the use of the Diesel principle of combustion. A number of other questions relating to details of construction and operation, theoretically and practically, were put to Mr. Knight, who answered them with a promptness which evidenced his familiarity with his subject.

After the members present had expressed their thanks to the inventor for his delivering the lecture, the meeting was officially closed, but it was not until after 11 p. m. that a number of engineers ceased to fire questions at Mr. Knight.

Knight Talks to Quakers

PHILADELPHIA, Jan. 14—Preceded by moving pictures of the last Fairmount Park road race and of the small car race in France, Charles Y. Knight, inventor of the Knight silent gasoline motor, in a very entertaining talk, illustrated by numerous lantern slides, outlined the history and details of the invention bearing his name to members of the Quaker City Motor Club and their guests in the banquet hall of the Hotel Walton Tuesday evening, January 9.

Meeting and Banquet of the M. & A. M.

Banquet of the Motor and Accessory Manufacturers in the grand ballroom of the Waldorf-Astoria

AT THE annual meeting of the Motor and Accessory Manufacturers the following were elected to serve during the coming twelvemonth: President, H. T. Dunn; first vice-president, James H. Foster; second vice-president, C. E. Whitney; third vice-president, Claire L. Barnes; secretary and assistant treasurer, L. M. Wainwright; manager, William M. Sweet.

The annual meeting of the directors was well attended at the Waldorf last Friday, and beside electing the officers named above the following committee asignments were made:

Executive Committee—The president, first vice-president and the last retiring president.

Show and Allotment Committee—D. J. Post, H. E. Raymond, C. T. Byrne, James H. Foster, F. C. Billings.

Finance Committee—James H. Foster, H. E. Raymond, C. T. Byrne, W. H. Crosby.

Traffic Committee—D. J. Post, Claire L. Barnes, George Baum.

Membership Committee—L. M. Wainwright, C. E. Whitney, T. J. Wetzel.

The first named in each committee acts as chairman.

The annual report of President Dunn was couched in optimistic terms. He showed that the condition of the association was prosperous and that the past year has been the best in its history. The membership rolls show a gain of twenty-nine members during the year. The formation of an executive committee was the result of pressure of business requiring such a body. The work of the credit department was highly praised and the various other departments were commented upon with an extra word of commendation for Manager Sweet.

In addition to the two new members admitted at the last meeting, the American Bronze Company, of Berwyn, Pa., and the Detroit Lubricator Company were elected to membership.

On Wednesday night, January 11, 400 members and guests of the Motor and Accessory Manufacturers sat down to the association's annual banquet in the huge ballroom of the Waldorf-Astoria. H. T. Dunn, president, was in the chair. James Clarence Harvey acted as toastmaster, and, despite a heavy cold, kept the assemblage in a roar of laughter with his introductory witticisms.

W. E. Metzger, president of the National Association of Automobile Manufacturers, who was introduced as an electric self-starter, complimented the M. & A. M. on its virility and urged even greater co-operation between it and the N. A. A. M. J. Hartley Manners, the well-known playwright, commented on the benefits bestowed upon the theatrical business by the automobile. It had annihilated distance, he said, and at the same time provided adequate protection against inclement weather of all sorts.

Col. George Pope, representing the Automobile Board of Trade, gave a short history of the automobile show situation and was accorded the honor of three hearty cheers and a tiger at the close of his address. Among the others speakers were James Schemerhorn and Cresswell MacLaughlin, who characterized the automobile as the greatest potential factor in civilization, next to the printing press. A vaudeville performance followed the banquet.

Colt-Stratton Company Holds Smoker

Optimism and good fellowship were the striking features of the second annual automobile show smoker held by the Colt-Stratton Company at Healy's on Saturday night. The entire sales force of this concern, the general Eastern distributors for the Cole Motor Car Company, as well as several prominent members of the engineering corps and associated concerns were invited to participate in the informal jollification, which has been made an annual event. After the close of the banquet, which stretched well into Sunday, there was a series of short addresses given by J. J. Cole, of the Cole company; Harry L. Stratton, C. P. Henderson and A. F. Knobloch, of the Northway Motor Company, and several members of the selling force of the Cole cars from all parts of the country.

N. A. A. M. Holds Its Annual Meeting

MOST optimistic views of trade conditions and association work were taken by the members of the National Association of Automobile Manufacturers who attended the annual meeting at the association office on Thursday, January 11. President Metzger in his address said in part: "The year has been without exception the most successful we have known. We have seen such a development in our membership, our financial resources and our influence that the association has once more taken its place as the unquestioned head of the industry. I am hopeful that next year my successor may be able to say that it is the only association making claim to national importance or assuming to carry out any part of that work for which this association was organized.

"Our membership embraces 90 per cent. of the principal manufacturers. Our relations with other organizations are friendly. With the opening of the season we had sixty-three members, to which we have added twenty-five during the year, making the total of eighty-eight. A great part of our work, particularly that referring to the improvement of the highways, is directed through the A. A. A., whose officers render their services gratuitously and put wonderful energy behind their work, solely for the good of the cause."

Mr. Metzer dealt at length with the work of the commercial vehicle department which was organized at Chicago last year and is now rendering important services. He suggested that the department be continued and its powers increased so that it may be able to cope with all the difficult problems to appear in the near future. The legislative committee dealt with the association's efforts to bring about uniform motor vehicle laws in all the states and to promote federal legislation.

Seven years ago, according to this report, there were no two motor vehicle laws having the same rate of miles per hour. And there was no state which had any other provision than one laying down a hard and fast miles-per-hour limit. The committee has been trying to correct these conditions and to show that danger to the public depends not upon the number of miles per hour, but on observation of the particular conditions of time and place.

Lately one state after another has adopted this view until a number of states, including New York, Illinois, Connecticut and Michigan, have passed laws in the changed form. The committee has also removed objections to the proposed federal law concerning which the Attorney General has approved the efforts and judgment of the committee.

The report of the commercial vehicle committee embraced many subjects of technical interest, as, for example, the standardization of parts and the adoption of a standard form of warranty. The good roads committee showed that its efforts had been directed largely toward the organization of state highway commissions where none exist and doing everything possible for the promotion of federal and state aid. Incidentally it has rendered assistance in the promotion of the bill for building of a Lincoln memorial highway from Washington to Gettysburg. The committee is deeply interested in a movement to bring together next fall in one great convention all of the interests that are seeking to bring about road improvements on national lines.

Transportation matters were dealt with in detail by the traffic committee, which recited the accomplishments of the year and showed great advantages secured for the industry. The advantages of the work of this department, formerly derived by automobile manufacturers only, is now extended to the members of the motor and accessory manufacturers and the department is now regarded by the railroads as the authority on all matters relating to the transportation of parts and accessories.

G. W. Bennett, Hugh Chalmers, R. D. Chapin, A. L. Pope and W. T. White were elected members of the executive committee, which consists of fifteen members, the remainder holding over until 1913 and 1914.

The annual election of officers will take place at the monthly meeting of the executive committee, which will be held at the First Regiment Armory, Chicago, Wednesday, January 31.

Riker Vice-President of M.C.A.

A. L. Riker, of the Locomobile Company of America, was elected vice-president of the Manufacturers' Contest Association at the annual meeting of that organization last week. The other officers were re-elected, as follows: Howard E. Coffin, president; E. R. Hollander, secretary-treasurer and Russell A. Field, assistant secretary-treasurer.

The new board of directors consists of H. E. Coffin, A. L. Riker and E. R. Hollander, as before, and George M. Dickson and C. A. Emise. Howard Marmon remains chairman of the rules committee pending the appointment of his successor.

The advisory board consisting of S. A. Miles, H. A. Bonnell and Jesse Froelich was re-elected.

A committee of five to confer with the A. A. A. regarding future government of contests was named as follows: E. R. Hollander, chairman; A. L. Riker, C. A. Emise, M. C. Meigs and P. D. Wagoner. The membership of the M. C. A. has increased from thirty-nine to ninety-three during the past year.

Among those present were: H. E. Coffin, J. G. Vincent, Howard Marmon, E. R. Hollander, William E. Metzger, A. L. Riker, C. A. Emise, George M. Dickson, M. C. Reeves, H. G. Farr, Jesse Froelich, P. D. Wagoner, Henry D. Watson, Charles Boyden, M. C. Meigs, Paul H. Bruske, D. M. Ferguson, F. C. Vandewater, H. A. Bonnell, and Russell A. Field.

Wine and Gasoline Will Not Mix

If any further proof were necessary to demonstrate that the automobile industry is on a strict business footing, it was afforded by Col. James A. Muir, who presides at the bar of Madison Square Garden, and who for thirty-three years has been a prominent figure on the metropolitan race tracks.

Colonel Muir, in explaining the situation from his viewpoint, presented the following philosophical remarks:

"Wine-buying no longer is an important element of automobile selling. In fact, wine-buying was reduced to small comparative proportions this year. A few years ago when a sales-manager closed up a contract for a good round number of cars, or when a salesman signed up a customer for an expensive car, or when the first and last cars of the show season were sold, there was just one finishing touch required to lend eclat to the occasion. That was for the seller to open some wine.

"In those days the process was repeated by nearly every exhibitor at some time during the week. But now the automobile industry has degenerated into a plain, everyday business. I suppose the fact that all the sporting men are broke, due to the horse-racing laws, has something to do with the situation. When they had money they spent it broadly and we took our share for wine. Now they are all broke and we sell little wine."

In the Legal Field--Chain Grip Suit

CHAIN grip companies are lining up for another sharp battle in the courts which may prove the beginning or the ending of a hard campaign. On January 11 Judge Hough, of the United States District Court, Southern District of New York, issued a temporary injunction against the manufacture, sale and use of the Atlas chain grip in the suit of the Weed Chain Tire Grip Company.

The motion for preliminary injunction pending the final disposition of the case is set for January 26 before Judge Lacombe and answer is required by January 20.

The particular point at issue between the parties is as to the snugness with which the respective chains fit the tires. The Weed company has been successful in a long series of suits against chain manufacturers, and the Parsons patents have been affirmed on numerous occasions. The complainant state that chains of the Atlas type, fitting snugly to the wheel, have been contemplated in some of the rulings and assert that the Atlas company has had a chance to defend its device in the recent suit brought against the Automobile Co-operative Association of America. The Weed party declares that such defense was not made, allowing the case to go by default.

The Atlas Chain Company appeared in court on January 13 and moved that the temporary injunction be set aside on the ground that the company is not a resident of Manhattan and that suit against it should have been brought in the Eastern District of New York, at Brooklyn. This was denied because the charter of the Atlas company gave 25 Wall street as its residence, despite the fact that the company's factory and offices are in the Bush Terminal on Long Island.

After the court had overruled the motion for a stay of the injunction the complainants caused a copy of the order to be served upon the Atlas representatives in the basement of Madison Square Garden and the exhibit was summarily closed.

The residence given was established before the company was really formed and the factory and offices have never been in Manhattan.

The Atlas people reply that all of the cases so far instituted by the Weed company, in which that concern has been successful in the courts, have been founded upon infringements that were material as against the Parsons patents. On the other hand, however, they state that there are two decisions of the United States courts that uphold their contention that the snug-fitting chain is not an infringement. One of these was rendered by Judge Amidon at Boston and the other by Judge Angel in Detroit. In the Circuit Court of Appeals at Chicago, it is claimed, a decision was rendered to the effect that if a chain is fitted loosely to the wheel so that it falls to the ground in front of the wheel by the force of gravity, it may infringe the Parsons patent, but if it fits snugly and does not fall to the ground by gravity it is not such an infringement.

The Atlas company also states that the reason for its failure to defend the Co-operative case was due to the fact that the defending concern was not in position to carry on a long legal fight in the upper courts and that it would have been obliged to shoulder a very large portion of the defense.

Klaxon Enjoins Ever-Ready Horn

Judge Hough, of the United States District Court for the Southern District of New York, has just rendered an opinion directing an injunction restraining the American Ever-Ready Company from selling an imitation of the Type L Klaxon warning signal made by the Lovell-McConnell Manufacturing Company, of Newark, New Jersey.

This decision was rendered in one of the several suits brought by the Lovell-McConnell Manufacturing Company against the American Ever-Ready Company for alleged infringement of seven patents and for unfair competition.

Judge Hough's decision is to the effect that the Ever-Ready motor-driven horn is so much like the Type L Klaxon that

"... it must be a very little distance indeed within which anyone can distinguish a Klaxon horn from an Ever-Ready. Undoubtedly a critical examination shows divergence in position of fastener-arms, variations in at least one curve when measured even with the eye and not very prominent exhibition of differing name plates—but what strikes the beholder, even when his attention is directed to distinctive parts, is not the difference but the general, unnecessary, and apparently intended resemblance of the latter to the earlier device—and this resemblance is nearly summed up by mentioning the right-angled form of construction above alluded to."

Judge Hough concludes: ".... an injunction will issue restraining defendant from using complainant's characteristic right-angled construction, ..."

The motion in this case was filed December 28, heard January 5, and the ruling was made January 15.

Ban Is Raised: Morgan & Wright Appeal

On motion of attorneys for the Morgan & Wright Company the decree entered in the suit of the Republic Rubber Company versus Morgan & Wright provides for the suspension of the preliminary injunction granted to the Republic company pending final hearing of the cause on appeal.

District Judge Hazel heard counsel for both sides and ruled that the injunction should be suspended until the case was finally adjudicated in the United States Circuit Court of Appeals, which may conclude the case at any time within the present year. In fact, it might be possible that the matter will remain unfinished for a longer period. The probabilities in the case are that it will be cleared up before September.

In the meantime the defendants are placed under bond of $25,000, which was required to be filed to cover possible damages to the complainant that may arise from the continuance of manufacture by the defendant between the time of rendering the present decision and final adjudication. This bond does not cover possible damages that accrued prior to the decision.

The defendants are given thirty days to perfect their appeal to the upper court for revision. Morgan & Wright are not forbidden to make and sell the type of tire in question.

Defining the Chauffeur's Rights and Duties

According to an interesting decision handed down by the First Appellate Division of the New York Supreme Court in the case of Wooding versus Thom it is unanimously held that an automobile company is liable for damages when its demonstrator allows an employee of a prospective purchaser to run the car, providing an accident occurs.

In this case the Thom company, in endeavoring to sell a car, employed a demonstrator who allowed the chauffeur of the prospective purchaser to operate it on the streets of New York with the result that a young woman was knocked down and badly hurt owing to the lack of skill displayed by the chauffeur. The court held that the Thom company was responsible for the acts of its demonstrator but that the prospective purchaser, who had not authorized his chauffeur to engage in a driving test of the car, was not liable in damages.

Forty-eight Entries for Grand Prix

WITH forty-eight fully paid entries and the prospect of more at double fees, the Grand Prix race of the Automobile Club of France, to be run at Dieppe during the second fortnight of June, is already assured of success. It will doubtless be the largest number of entrants obtained in any big European race for the last five or six years, for the last Grand Prix, which was a record in this respect, brought out forty-nine cars. A week ago it looked as if the race would have to be withdrawn, for at that time the secretary of the racing board had only received twenty entries, and one of the conditions was that a minimum of thirty should be obtained for the event to take place. Germany boycotted the race, Italy decided to do the same, while many of the older French makers, after voting in favor of a race, declined to take part in it. The younger firms, however, came forward in big numbers, and with the assistance of some of the most progressive English firms the number of starters was more than doubled within a week.

The French firms taking part in the race are Lorraine-Dietrich, four cars; Peugeot, four; Darracq, four; Gregoire, four; Alcyon, three; Vinot & Deguingand, three; Sizaire & Naudin, three; Tr. Schneider, three; Koecklin, one; Cote, two. The Britishers are: Sunbeam, four; Singer, two; Vauxhall, three; Arrol-Johnston, three; Calthorpe, three; Germany sends one Mathis car; Belgium is represented by an Excelsior, and at present the only American entrant is a Ford put in by Henri Depasse, the selling agent of the company in France. All the cars are four-cylinder, four-cycle models with the exception of the two Cotes and the Koecklin, which are two-cycle models.

The Grand Prix race is unique by reason of the distance to be covered. It has been decided that the test shall comprise a distance of 1,200 miles to be covered on two consecutive days, the cars to be placed in a garage under military guardianship at the close of the first day, and only handed over to their respective drivers a few minutes before the start on the second day. It is considered by the racing board that the value of the cars can only be revealed by a long-distance test of this nature. Although there is only one race, and one first prize of $4,000, together with a team prize of $2,000, there are two distinct classes, one being for light cars having a four-cylinder motor of not more than 3,000 c.c. with a minimum chassis weight of 1,763 pounds, and the other for cars without limitation of power or weight. The light car regulations are practically the same as those in force for last year's race at Boulogne-sur-Mer, the only difference being that the minimum body dimensions have been removed. As these cars will probably average 63 to 64 miles an hour for the full distance, they will be quite as impressive as the bigger racers, and may indeed succeed in winning the first prize, for it is doubtful if the big cars, having more stoppages for tires and fuel, will put up a higher average.

The presence of fifteen English cars in the race is a most noticeable feature and is accounted for by the fact that the race will be run near the seacoast town of Dieppe, or so near to London that it will attract as much attention as if held in Great Britain, and also by the desire of many of these firms to secure a footing on the French market. Already five English firms have opened up establishments in Paris.

Just after the close of the last National Show to be held in Madison Square Garden

Quaker Show Fills Two Armories

PHILADELPHIA, Jan. 13—Frigid weather and streets and sidewalks covered with a sheet of ice that made riding and walking hazardous occupations did not deter Philadelphians from turning out in force to witness the opening of the eleventh annual automobile show tonight. Philadelphia has had ten previous shows, and each was considered a model of its kind, but it remained for this eleventh exhibition, or "business exposition," as it has been aptly termed, to establish a standard for number and variety of displays, beauty of decorations and enthusiastic response upon the part of the public.

Civic indorsement was given the event by the presence of Mayor Blankenburg, he formally declaring both exhibitions open, first appearing at the First Regiment Armory, Broad and Callowhill streets, and then being whisked south on Broad street to the Third Regiment's structure. At both armories the Mayor made short speeches and turned on the flow of electric lights that officially marked the beginning of the two weeks' exhibition.

Outside of the old cry of lack of room, the show is the most brilliant that it has ever been the good fortune of Philadelphians to witness and the outburst of enthusiasm that greeted Mayor Blankenburg's assurance of a larger building in the course of two or three years was deafening. The Mayor paid a high tribute to the automobile industry and to the high character of the men comprising it, saying that from a beginning that was practically negligible fifteen or twenty years ago, an industry had grown that employs hundreds of thousands of men at good wages and that today stands in the front rank among industries in the United States. When he announced that he hoped in the course of two or three years to have a building centrally located, easy of access, 400 x 400 feet, that would house twice the combined displays of the two armories, he was liberally applauded.

There are thirty companies represented in the First Regiment Armory and twenty-seven in the Third, a total of upward of 300 cars being on view, the total monetary value of which is appraised at $1,500,000. There is no method of computing the magnitude of this year's exhibition were there a structure of sufficient proportions to allow of unlimited disposal of space. While the automobile has become more firmly entrenched, the accommodations have not kept pace with the industry's forward strides. Long ago the annual exhibition outgrew one building and now two of the most commodius structures that could be secured are inadequate.

Of course, no more space could be allotted than last year and in view of a year's growth in the trade it is only natural that the disappointments of crowded-out exhibitors are more numerous. And in some cases those who were fortunate enough to be placed inside either building found it impossible to secure as much display room as they desired.

But massed beneath the roofs of the two armories is a magnificent collection of automobiles. Indeed, there is so much to see that with few exceptions, the combination ticket issued for admission was not wholly used tonight. Once within the confines of either building there was so much that was attractive to see and to learn that unless only a superficial observation was taken, it was an impossibility to "do" both places. To all intents and purposes the exhibition amounts to two separate shows for the average person.

Members of the show committee of the Philadelphia Automobile Trade Association, under whose auspices it is being conducted, worked untiringly and enthusiastically to make this year's show a banner one, and all previous events have been eclipsed. The whole week the two buildings have been in the hands of a corps of carpenters, electricians, decorators, etc., and the transformation has been complete. On entering either building the visitor is immediately impressed by the absence of girders and unsightly woodwork, and with no obstructions a complete view may be had.

In the Third Regiment Armory the pictorial idea that has been so successfully carried out shows the Forest of Fontainebleu, France, the main canvas stretching along the entire eastern wall. On this canvas are shown the depths of the forest approached from either side by the road from Paris, on which have been pictured automobile parties on their way through the forest. The north, south and west walls are laid in a series of panels of various scenes. All the trees and woodwork throughout the building resemble natural bark overgrown with foliage and interwoven with branches and leaves. The rafters are studded with myriads of electric bulbs, the whole forming a triumph of the decorator's art.

At the First Regiment Armory the main scene is a panorama of the Bay of Naples, showing the harbor and Mount Vesuvius in the distance. The side walls are in balustrade effect supported by a stone wall overgrown with moss and plants. Over all is a triumph of the decorator's art.

The individual electric signs designating the booths of the various exhibitors in both structures are of uniform size and shape, being shown as the apex of an inverted pyramid suspended by invisible wires from the ceiling, the name of the car being on the sides. The decorations are the most elaborate for temporary purposes ever carried out.

Exhibition spaces are of uniform size and design, and the aisles of convenient width, enabling freedom of motion, and in spite of the large attendance the arrangement of the spaces facilitated movement in any direction and the roomy aisles were at no time uncomfortably crowded. The attendance was a cosmopolitan one, comprising as it did those who were there merely to see as well as those hunting new mounts. The fair sex was out in force. Divans were placed at frequent intervals throughout the halls for the leg-weary. Many there were to whom the purchase of a motor car was an event and those to whom the transaction merely represents an annual occurrence. But it did not make any difference, they all knew their subject, gave all makes minute inspection and kept the willing salesmen busy answering queries; nor were they lacking when it came to arguing technical questions, motors, mechanism, etc.

Very material advancement is shown in the models on exhibition in the adoption of the left-hand drive, the tendency toward simplicity and accessibility of working parts, self-starting equipment, electric lighting, the Knight double-sleeve motor and the six-cylinder. In addition to which are many refinements that are not visibly apparent to the uninitiated, but which furnished food for discussion among the motor-wise.

Looking toward the comfort of the owner has been an important consideration with manufacturers, and material contributions toward this end are seen in heavier and thicker upholstery and in a simplification of operation. The self-starter has taken hold with a vengeance, as has the use of electric lights.

Band concerts formed an enjoyable feature of opening night and they will be continued every afternoon and evening for the two weeks. The show will open each day at 10 o'clock and remain open till 11 at night, this move having been decided upon by the Show Committee in view of the large number of out-of-town visitors. Wednesday will be Society Day, and the price of

admission will be doubled. This will probably thin out the crowds a little and give more opportunity for a close inspection of the many models.

At the Third Regiment Armory in addition to the twenty-seven makers of gasoline pleasure cars there are a score of accessories dealers represented, occupying the north and south walls.

Large electric signs extend across Broad street at Callowhill, Arch and Wharton streets with the words "Automobile Show" lighting the way.

The Show Committee consists of George W. Hipple, chairman; J. H. Beck, secretary of the Philadelphia Automobile Trade Association, and manager of the show; Frank E. Eveland and J. A. Wister. Louis C. Block, president of the Trade Association, was present and participated in the opening exercises.

Next week the two armories will be turned over to the display of commercial vehicles and electrics, of which there will be about forty makes of the former and ten of the latter.

It will be Monday or Tuesday before the show is running smoothly, not all of the exhibits being fully installed tonight.

Among the accessories displays were some that made their first appearance at any show, some of these being:

The Vulcanizing Company, 225-227 North Clarion street, is featuring the Rotary Tire Grip. This consists of two rim chains attached in the ordinary manner and a series of cross-cables of inelastic rubber; the cross-cables are practically of the same material as the tire itself and swiveled at the connections, which permits free rotation, distributing the wear on tire and cables. In addition to the Rotary Tire Grip the company's exhibit consisted of steel-studded tires and invisible repairing.

The Tokheim Manufacturing Company, Inc., of Cedar Rapids, Iowa, is showing self-measuring oil outfits, making a special display of the Dome Long-Distance Outfit, which allows of measuring and inspecting every quart of gasoline before transferring to the car's tank. The outfit is furnished with priming chamber, drainback, pipe-emptying device, automatic clean-out for underground tank and gasoline strainer.

The Auto Equipment Company has a complete showing of the Booth Demountable Rim and King Powder for polishing brass, copper, metal, etc.

Lenhart Manufacturing Company, 246 North Delaware avenue, is exhibiting Tri-Radiant light fixtures.

Manufacturers' Supplies Company—A comprehensive display, including Speedo, Stephens carbureter, Eagle windshields and Parker locks, the latter an effective device for the locking of gears.

Motor Specialties Company, 651 North Broad street—The Disco self-starter for gasoline engines. Also the Mondex-Frary lighting system and the Mondex shock-preventer.

The Monitor Manufacturing Company, of Landisville, Pa., is showing for the first time its Climax self-measuring and non-measuring oil pumps and outfits, insuring the deliverance of the exact amount of lubricating and paint oils, kerosene, etc., desired, all working parts being enclosed.

The Keystone Lubricating Company has on exhibition a varied line of oils and greases, with a practical demonstration of their efficacy to all sorts of weather.

The pleasure cars shown include:

Third Regiment Armory—Packard, Oldsmobile, Hudson, Haynes, Enger, Alco, Abbott-Detroit, Knox, Lozier, Mitchell, Marmon, Peerless, Cadillac, Pierce-Arrow, Buick, Fiat, Chalmers, Chadwick, Bergdoll, Warren, Marquette, Pope-Hartford, Stoddard-Dayton, White, Winton and Stevens-Duryea.

First Regiment Armory—Cartercar, R. C. H., Case, Everitt, Elmore, Brush, Stearns, Garford, Speedwell, Ford, Maxwell, Columbia, Matheson, Imperial, National, Nyberg, Hupmobile, Mercer, KisselKar, Rambler, Reo, American, Locomobile, Oakland, Overland, Velie, Stanley, E-M-F, Flanders and Firestone-Columbus.

The idea of opening the show earlier and keeping it open later than has been customary at previous shows, has struck a popular chord, the attendance exceeding expectations.

Milwaukee Show Open On Sunday

MILWAUKEE, WIS., Jan. 15—More than 55,000 square feet of floor-space are occupied by exhibits and displays at the fourth annual Milwaukee automobile show, the second under the auspices of the Milwaukee Automobile Dealers' Association, which opened in the Auditorium on Saturday night, January 13, and will close Friday evening, January 19. The entire first floor of the building, the largest single structure of its kind in America, is occupied by the show, and in addition the large basement under the main arena floor is utilized.

The total number of exhibitors at the show is 109, distributed as follows: Pleasure car exhibitors, 45; commercial car exhibitors, 24; accessory and supply exhibitors, 39; motor boat exhibitors, 1.

The total number of pleasure cars on the floor of the Auditorium is 261 and there are 27 cars in the basement, or commercial car division. Sixty-seven makes of pleasure cars are exhibited and the largest number of cars exhibited from one factory is eleven.

A 5-ton Alco truck was shipped *via* a boat line out of Chicago on Friday night, but the boat was unable to make headway to Milwaukee. The truck was run off and filled up with gas and oil and driven 91 miles, to Milwaukee, the start being at 9:30, Saturday morning. At 11:25, Saturday night, the big car, covered with ice and snow, rumbled up to the Auditorium and was given its place in the commercial division as the lights were being turned out in the arena.

The decorative scheme this year is one of unusual beauty, being of a semi-tropical type in a monotone green, deep cardinal and gold. The names of all cars are placed in fac-simile on the signs above the exhibits, each of which is divided from the others by rails and fences in artistic design.

A striking feature of the 1912 show is the more hearty co-operation of factories with the local dealers, made most apparent in the large number of polished chassis, cut-out motors and other "big show" display stuff. Almost every exhibitor has a polished or well-painted stripped chassis. The Knight motor is shown by the Stearns representative in cut-out form and is proving to be one of most educational exhibits at the show. Another Knight type is the Stoddard six, which had made 7,000 or more miles before being brought to Milwaukee. One foreign car, the Fiat, is shown in polished chassis.

Among the new makes never before exhibited in Milwaukee are: Abbott-Detroit, Elmore, Stearns-Knight, Hupp-Yeats and Flanders electrics; R. C. H., Oakland, Oldsmobile, National, Herreshoff, Westcott, Everitt, Garford, Courier-Clermont, Premier, King, Union, Michigan, Nyberg and Paige-Detroit.

Newcomers in the commercial car division are: Pierce-Arrow, Ford, Chase, United States, Monitor, Menominee, Peerless and Progress.

Previous Milwaukee shows have generally been opened on Monday or Tuesday nights and continued until Saturday. This year's show was opened on a Saturday night, as are the big shows, and the experiment proved successful, judging from the attendance. The show was open all day Sunday, too, which was another experiment that proved successful.

Peoria Show a Success

PEORIA, ILL., Jan. 13—With a record-breaking attendance, the Peoria Automobile Show closed last evening at the Coliseum. Despite the severely cold weather, 30,000 people attended the show during the four days on which it held forth.

Seventy-two cars were sold outright and nearly 200 agency deals were closed up during the show.

Nearly 200 cars were on display, a score of motorcycles, and hundreds of accessory exhibits.

It is estimated that at least 8,000 out-of-town people visited the show. Society night—the opening evening—was marred by exceptionally cold weather, and it was proposed that the show continue over Sunday, to make up attendance totals. But the excessive crowds of the closing day dismissed any cause for such action. From every standpoint, the show has been highly successful.

News of Other Local Shows

OTTAWA, ONT., Jan. 15—The first annual automobile and motorboat show will be held under the auspices of the Ottawa Motor Car Association at Howick Hall, February 12 to 17. The Ottawa Valley Motor Car Association has been active for the past three months in making this show a big success. The decoration scheme which is being worked out now assures the visitors of ont of the best-decorated automobile shows ever held in Canada. Thousands of incandescent bulbs with combinations of colors of the motor association will decorate the ceiling and walls.

Amid such attractive surroundings will be the latest offering of thirty-four manufacturers of motor cars, representing a valuation of more than $200,000.

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ATLANTA, GA., Jan. 12—The applications for space in the Atlanta Automobile Show overran the original estimate of 18,700 square feet by so large a margin that the show committee has decided to sell the space under the seats and by so doing has increased the available area to 22,700 square feet, all of which has been engaged. It has been decided that it is too late to build a flooring over the seats and exhibitors who have not already secured space cannot be accommodated.

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LOUISVILLE, KY., Jan. 16—The fifth annual exhibition of the Louisville Dealers' Association, which is to be held in the First Regiment Armory, has been postponed from February 21-24 to March 6-9. The 1912 show is scheduled two weeks earlier than last year. Members of the various committees in charge of the display did their work so well in 1911 that they have again been selected to stage the motor show. According to present plans for decorations, the main aisle will be lighted with pedestal electric lamps, imitative of the light standards on the Long White Way in this city. The decorative scheme will be elaborate, but all of the details have not been worked out.

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BALTIMORE, MD., Jan. 15—The time for placing applications for floor space at the local motor car show, to be held in the Fifth Regiment Armory from February 20 to 28, has elapsed. The list shows that thirty-four dealers have asked for floor space. Drawings for space by the dealers will be made on January 22. Applications from accessories dealers will be received until January 24 and for the commercial cars until January 25. The show committee will co-operate with the trade organizations of the city in regard to the commercial end of the show and will help to boom Baltimore as a commercial car center.

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PITTSBURGH, PA., Jan. 16—Many of the luncheons and dinners in connection with the Duquesne Garden Show will be held at the $1,000,000 club house of the Pittsburgh Athletic Association near by. The exhibitions are being booked at a rapid rate and the proportion of trucks will be even larger than last year.

Detroit Show Next

DETROIT, MICH., Jan. 15—With the opening of the Detroit show only a week away, there are some busy days ahead of Manager Walter Wilmot, his assistants and the officers of the Detroit Automobile Dealers' Association, under whose auspices the show is to be held. Already many of the exhibits from the Garden show in New York are here, waiting to be placed, but other demands on the Wayne Casino, where most of the exhibits will be housed, have made it impossible for the D. A. D. A. to take possession and, in consequence, the entire show, including decorations, must be put together in less than a week's time.

In order to get the cars to the second floor of the Casino it will be necessary to tear out a portion of the rear wall and construct an incline, which must be shored up and otherwise made solid. The cars will be hauled up by block and tackle. But this is only a small part of the work. The whole interior must be practically made over, an elaborate lighting system must be installed, the floors must be covered and other details attended to before the cars can be moved in

The difficulties and the tremendous expense incident to the preparations for this year's show, involving the erection of a temporary annex at a cost of over $10,000, have caused a revival of the agitation for a permanent show building. The same talk was heard last year, and at one time it looked as though it were really going to develop into something tangible, but the summer came on and, in the rush of business, the dealers lost sight of the building project.

This year's experience has taught them, however, that it is not a very profitable undertaking to erect buildings to be torn down again after they have been in use but a single week. Some of the more enterprising dealers and manufacturers believe that Detroit is large enough and important enough as a convention city and the center of the auto industry in this country to afford a convention hall built on modern lines, which could be leased for all sorts of gatherings and be made self-supporting. The motor car industry has gone a long way toward freeing the city from the fetters of ultra-conservatism that retarded its progress through many long generations, but a trace of the old spirit remains and it is seen in the indifference of the money interests to all efforts to secure a public building.

Object to Two Shows in Buffalo

BUFFALO, N. Y., Jan. 16—The Buffalo Automobile Trade Association is opposed to the holding of a second automobile show, declaring that one show each year ought to be sufficient for automobile dealers to support. Local dealers contend further that New York is the only city in the United States which has two shows a year and in that city there are not facilities for accommodating all of the exhibitors at one show.

However, plans for the second show, which is in charge of George C. Fehrman, are rapidly maturing and space is rapidly being taken. Exhibitors at this show, to be held in Convention Hall, February 5-10, will include local dealers and several out of town concerns.

Grand Rapids Show to Run Five Days

GRAND RAPIDS, MICH., Jan. 15—Owing to the increasing demands for space and the popularity which will undoubtedly greet the 1912 Grand Rapids Automobile show, the show will be held for five days, February 13 to 17, inclusive, instead of four. One of the features of the exhibit will be the decorations, which will be absolutely fireproof.

The display of 1912 models will represent a value of at least $500,000 and will occupy a space of 50,000 square feet. This is outside the display of accessories. Although the drawing of space for the accessories has not been made it is evident that it will be oversubscribed, the same as the space for motor cars, which has already been allotted.

New Alco Truck Record

WORKING steadily in the Jersey hills, the Alco 3 1-2-ton truck which started on a 14-day trial for the United States Express Company, on January 6, is still laboring on its non-stop run. When it had been going for 168 hours it passed the record mark established last year by a similar truck.

The tabulated figures covering the run up to last Friday show that the truck is averaging 65 miles a day and making over 101 stops for delivery and loading in each 24 hours. The average load carried during each day was 31,027 pounds or about 15 1-2 tons of express freight.

The gasoline consumption at 168 hours, the former record, had been 186 gallons or about 1 1-8 gallons for each hour of service. This would be 27 gallons a day.

The intention of the American Locomotive Company is to keep the truck running 336 hours continuously.

The truck has done the work formerly done by five two-horse teams and ten men. It requires the services of but four express employees throughout the whole 24 hours. On Tuesday noon the truck had accomplished 249 hours without an adjustment. The truck makes from fourteen to twenty trips of 4 miles each during the day.

On the second day of the run the car encountered a snowstorm of great severity and since then there have been two blizzards to make operation disagreeable. The frozen roads have presented practically every element of poor going. Some of the grades are steep and with the snow the extra labor of the car has been very great.

Hundreds of storm-bound horses and horse-drawn vehicles have been passed by the truck during the test.

Three drivers, working in 8-hour shifts, are handling the car. The following table shows the detailed work of the truck up to the former record mark:

Date	Mileage	No. of Stops	Load
Jan. 6	79	132	19,000
Jan. 7	61	90	36,600
Jan. 8	59	92	31,450
Jan. 9	64	102	27,425
Jan. 10	62	92	27,187
Jan. 11	67	103	36,645
Jan. 12	65	98	38,890
Totals	457	709	217,197

Ohio to Have Highway Exhibit

COLUMBUS, O., Jan. 15—Ohio soon is to have a perpetual highway exposition. It will be located in the new Hartman Building, Columbus, O., and the large room which will be devoted to the purpose will be one of a suite now occupied by the State Highway Department. It is expected that, with the show in order, council committees from all over the state will visit Columbus to study the exhibits and hear lectures which department attachés will give on request.

Arrangements are under way for makers of paving brick, cement and macadam; producers of curbing and crushed stone, in fact, all firms engaged in furnishing road or street improvement supplies, to place exhibits in the permanent exposition.

Registration Follows Sale of Car

SYRACUSE, N. Y., Jan. 15—Secretary Forman Wilkinson, of The Automobile Club of Syracuse, has put motorists right upon an obscure phase of the Callan law which has been frequently overlooked. It had been assumed that when an owner sold his car he had no right to sell the tag with it, but that the new owner must secure a fresh tag for the car.

Mr. Wilkinson's interpretation of the law—which has been officially sustained from Albany—is that, when an owner sells his car, he must sell the number tag, too, and at the same time secure a transfer blank from the Secretary of State, which he must fill out to show that he is no longer the owner of the car. In case the seller then secures a new car, he must obtain a new number and must fill out the required blank.

Federal Aid for Roads

WASHINGTON, D. C., Jan. 16—The first federal aid convention for good roads ever held in this country opened today with Robert P. Hooper, president of the A. A. A., presiding.

The governors of twenty-three states sent 105 delegates to the convention, seventeen boards of trade and Chambers of Commerce sent twenty-eight delegates, thirteen good roads associations twenty-seven delegates, two farmers' organizations three delegates, and twenty-six automobile clubs and associations thirty-two delegates. In all eighty-one organizations were represented in the convention. Fifty or more delegates have been delayed in arriving on account of the heavy snow.

President Hooper introduced George C. Diehl, chairman of the good roads committee, who outlined in detail the purposes of the convention and who was then selected as permanent chairman of the convention.

At the suggestion of Lewis R. Speare, of Boston, a committee on resolutions was appointed to which will be referred all resolutions for action before they come before the convention.

Advocating an additional internal revenue tax of 10 per cent. on liquors and cigars, the revenue thus derived to be used in the building of good roads throughout the country, Jesse Taylor, president of the Ohio Good Roads Federation, aroused the delegates to the high point of enthusiasm of the opening session.

Congressman H. C. Claypool suggested the United States release at the earliest possible moment all claim to the Philippine Islands, and with the millions thus saved improve home possessions by building some first-class trunk-line public highways. Congressman Sherwood, advocate of dollar-a-day pensions, said: "Of course, I am for better roads, and for every legitimate means to make them better, not so much for the fast-moving automobiles, but for the benefit of those who drive and ride man's best animal friend—the horse."

Champ Clark, speaker of the House, received an ovation when he appeared at the afternoon session. He declared he was heartily in favor of the general proposition the convention was fighting for, and called attention to the fact that the cost of bad roads in this country was more than $800,000,000 a year, a sum almost equal to the national debt.

Senator J. H. Bankhead, of Alabama, pointed out reasons why the Government should help the building of good roads, quoting statesmen of the past who favored federal aid.

Representative Prouty said that if the money for building better roads could not be obtained elsewhere Congress might lop off a little from the naval appropriation bills and thus obtain vast sums. Many other Congressmen spoke during the afternoon and evening sessions.

T. Coleman Dupont gave a very interesting description of the road he is building across the State of Delaware.

Alco truck which broke all non-stop commercial records

A. A. A. Contest Board Meeting

AT ITS regular meeting on Thursday last the Contest Board of the American Automobile Association took drastic action in one or two cases. The formal application of Barney Oldfield for reinstatement was unanimously rejected. He is at present under disqualification and suspension until July 1, 1912, for promoting and participating in unsanctioned meets.

What undoubtedly will be the closing act of the Premier disqualification took place. H. O. Smith and the Premier Motor Manufacturing Company, who on July 27, 1910, were disqualified and suspended indefinitely because of denying the jurisdiction of the Contest Board and appealing to the courts for redress in the case of the Glidden award, were reinstated.

For advertising the performance of the two Abbott-Detroit cars which competed in the 1911 Vanderbilt Cup Race, held at Savannah, November 27, 1911, as being stock cars, the Abbott Motor Company, of Detroit, and the Abbott-Detroit Motor Company, of New York, were disqualified and suspended for six months to July 11, 1912. Rule 75 (a) of the 1911 Contest Rules prohibits the advertisement of the performance of a car as being the performance of a stock car unless such performance is made in an event regularly sanctioned for and open only to registered stock cars or stock chassis. The 1911 Vanderbilt Cup Race was run under the rules and with the sanction of the A. A. A., as a Class C non-stock event and was open to any motor car with a piston displacement of between 301 and 600 cubic inches whose manufacturer had within the preceding 12 months produced at least fifty cars. The Vanderbilt Cup race was not restricted to stock cars and no technical examination is made by the A. A. A. Technical Committee of cars competing in Class C events to ascertain whether they check up with the sworn and approved complete technical specifications on file with the Contest Board, as is required under the contest rules in those events which are open only to stock cars and stock chassis.

Because of the requests received for reservation of dates for 1912 contests and in order that definite fixed dates may be assigned by the Board to those promoters who are prepared to proceed with their preliminary arrangements, it was decided that no requests for dates would be considered unless such requests were accompanied by the sanction fees.

The following tentative reservations have been assigned, conditional upon the promoters complying with this ruling: February 22, Bakersfield (Cal.) road race, Kern Co. Racing Association; May 15, 16, 17, commercial vehicle run, Chicago Motor Club; May 30, 500-mile race, Indianapolis Motor Speedway; June 20, Algonquin hill climb, Chicago Motor Club; July 4, 5, 6, Beach races, Old Orchard (Me.) Racing Association; August 8, 9, 10, Beach races, Galveston (Tex.) Auto Club; August 23, 24, Elgin National Road races, Chicago Motor Club; September 2, Speedway meeting, Indianapolis Motor Speedway; October 5, Fairmount Park road race, Quaker City Motor Club; October 7-11, Reliability run, Chicago Motor Club.

Drivers' Benefit Meet at Los Angeles

LOS ANGELES, CAL., Jan. 14—The benefit carnival at Ascot Park today for Harris, Hanshue and Charles Illingsworth netted $3,000. Illingsworth lost a hand returning from the Phoenix race and Hanshue was severely injured when he went through the fence at Phoenix.

There were no speed contests today. Teddy Tetzlaff gave an exhibition in the grand prize Fiat and Harvey Herrick drove the world's record National. The 5-mile race for an average of 35 miles an hour was won by Caleb Bragg in a Fiat, Tetzlaff second. The 45-mile average for 5 miles was won by Tetzlaff with Herrick second. Tetzlaff beat Dingley and Herrick in a tire-changing contest and Herrick won a barrel-dodging race. A tug-of-war between the Reliance and Kelly trucks was won by the Reliance. The combination motor and sprint race was a tie between Louis and Joe Nikrent. The old-timers' duel for an eighth of a mile on bicycles was won by John Wiess, with Bill Ruess second.

Valve-Gear Patent To Be Adjudicated

Patent rights involving an improvement on the valve gear upon the cover plate of the crankcase as evidenced by letters patent owned by the Carlson Motor Company are in course of adjudication before the United States Circuit Court of Appeals. The suit now on the calendar was brought against the Maxwell-Briscoe Motor Car Company and prevailed in the lower court. It was carried to the upper court by the latter and will be finally heard next month.

M. C. A.-A. A. A. Contract Drafted

The present status of relations between the Manufacturers' Contest Association and the American Automobile Association, which still has several months to run, will be materially changed. A new contract to cover the situation has been framed by the committee of five appointed at the meeting of the M. C. A.

At present this contract is being referred to various officials of the M. C. A., and when it is finally approved it will be presented to the A. A. A. for ratification and acceptance.

W. C. P. Appoints New York Agency

Wyckoff, Church & Partridge, Inc., manufacturers of the Commer truck in the United States and the Guy Vaughan pleasure automobile, have closed a contract with the Transportation Sales Company, by which the latter concern will represent the former in the exclusive agency for both lines of cars in the metropolitan district.

It is announced that the selling company will take cars from the factory valued at over $1,000,000 during 1912. The company will locate in the present building occupied by the factory organization at Fifty-sixth street and Broadway and Wyckoff, Church & Partridge, Inc., will retain space for general and executive offices in the same building.

Edwards Resigns from United States Motors

H. J. Edwards, who has been chief engineer of the United States Motor Company in New York City, has resigned, to take effect during the month of February. Mr. Edwards has been one of the conspicuous motor car engineers, having developed the Stoddard-Dayton from its inception until its absorption in the United States Motors, at which time he was made chief engineer of all the companies in this corporation. At the time of his appointment as chief engineer for United States Motors he moved to New York, where he at present resides. Mr. Edwards was among the first to develop the valve-in-the-head type of motor, and was one of the few to bring out the present Knight double-sleeve type, the present six-cylinder Stoddard-Dayton being of his design. It is not known at present what course Mr. Edwards is to follow.

Late News of Interest to the Trade

DETROIT, MICH., Jan. 15—A rumor is current here that Clarence H. Booth is slated to succeed Walter E. Flanders as general manager of the Studebaker Corporation's Detroit plants, but no information is available at headquarters at this time. Mr. Booth's advancement has been rapid since he became identified with the E-M-F Company and he has proven himself an expert on production. He now has charge of that end of the business here.

A. E. Wood, who was recently chosen to take charge of the new Mitchell-Lewis agency here, has picked E. M. Dill, of the Berry Bros. Varnish Company, as his associate and they have formed the Mitchell-Detroit Sales Company, with quarters at 548-552 Grand River avenue for the present. Heretofore Mr. Wood has been engaged in the millinery business, but from now on will devote his entire attention to his automobile agency.

Frank J. Burrows has been made purchasing agent for the Briggs-Detroiter Company, manufacturer of the new car known as the Detroiter. He has been associated with Claude S. Briggs, organizer of the company, for the past three years in various enterprises.

Charles Y. Knight, inventor of the Silent Knight motor, will give his stereopticon lecture before the Wolverine Automobile club next Wednesday evening, explaining his invention in detail.

Tire Makers Meet Cut in Prices

The horizontal slash in tire prices announced by several of the leading manufacturing companies last week has spread and extended until it is now recognized to be almost universal. As stated in last week's issue of THE AUTOMOBILE, the reduction in prices is not effective as far as the consumers' list prices are concerned. The United States Tire Company, Firestone, Goodrich and one or two others have made definite statements to the effect that the new scale was in force. The Empire and others frankly state that the cut is being met pending the announcement of a new list of prices. The Diamond company denies that any change has been made in its prices, although there is some conflict as to the Diamond position in the minds of competitors. The Republic openly states that it is always a little slow in meeting changes in its list, but officers predict that such changes will be made before the end of the week. Goodyear is non-committal and it is generally accepted by the other companies that corresponding cuts in their lists will be made promptly to meet the new conditions.

One way of making the cut is to bill tires to dealers now under date of May 10 or thereabouts at full list prices and then allow the trade a discount of 5 per cent. This in effect would mean something like 7 per cent. off from the old level of prices to dealers.

So far there has been no action taken by any of the companies to touch the consumers' list. Most of the companies state that the reduction was made to ameliorate the condition of the dealer, who, it is said, has been doing business on a narrow margin of profit. It is generally reported that the cut is experimental in a sense on the part of the first concerns to take action and resulted from a mass of appeals from the dealers.

Presto-O-Lite Company May Move

INDIANAPOLIS, IND., Jan. 15—A city ordinance forbidding the manufacture of explosives inside the city limits has caused the Prest-O-Lite Company to decide to move its gas manufacturing and assembling plants to some other city. It is expected this action will be taken almost immediately unless the ordinance in question is repeated.

Formerly the company's gas manufacturing plant was located inside the city, but the city council enacted an ordinance forbidding the manufacture of explosives in Indianapolis. The company then moved its gas manufacturing plant to a point about 5 miles south of the city, while the assembling plant has been maintained in the city.

This arrangement has resulted in no little inconvenience and in much additional and expensive hauling. The company feels it can no longer bear this inconvenience and unnecessary expense. James A. Allison, secretary and treasurer of the company, states that the concern has three cities under consideration, one of which may be selected as its future home.

Mr. Allison states that though the plants may be moved, the main offices will remain in Indianapolis, as this is the home of Mr. Allison and also of Carl G. Fisher, president of the company. The Board of Trade has appointed a committee to see what may be done to retain the plants for the city.

Amalgamated Motors Company to Build Factory

LOS ANGELES, CAL., Jan. 16—The Amalgamated Motors Company, a new corporation, is about to complete taking over the Durocar Manufacturing Company, of this city.

The Amalgamated Motors Company has purchased a 6 1-4-acre site at Santa Ana, Orange County, Cal., and will erect a fireproof factory building of a model type, containing a manufacturing plant, a showroom, a clubroom feature, and in part of the building it will have the Orange County Board of Trade exhibit. It is located on the El Cameo Real boulevard, Los Angeles to San Diego, and the capacity for 1912 will be 1,000 automobiles. The company has contracts to supply the Hawaiian Islands and Australia and will do a general manufacturing business in every way. The models for 1912 will consist of the Duro pleasure automobile and Amalgamated motor trucks and will range in price from $1,000 to $3,000, having five types of chassis from 26 horsepower to 70 horsepower.

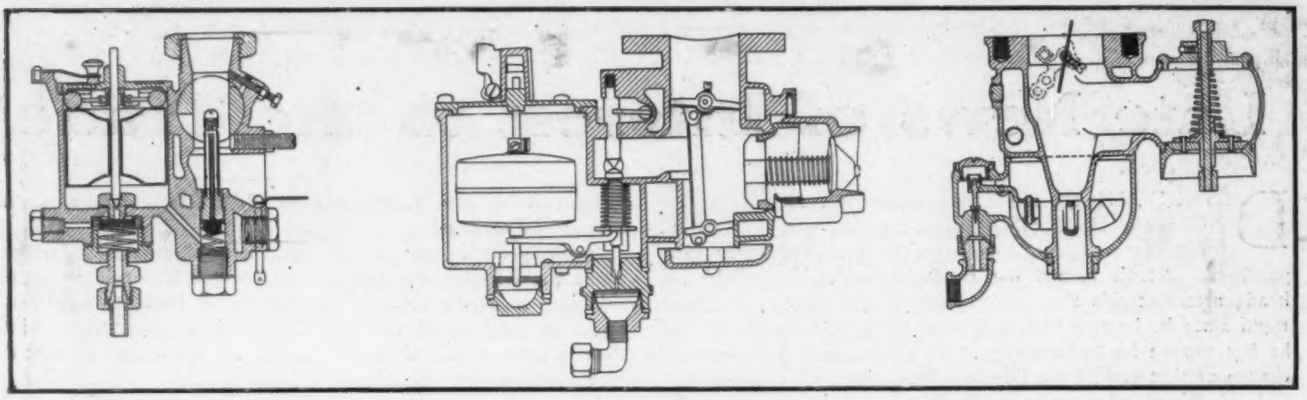
Promotion for Harry R. Radford

Harry R. Radford, general sales manager of the Cartercar Company for several years, has been promoted to the management of all the Cartercar activities except manufacturing. The promotion of Mr. Radford follows the recent resignation of R. A. Palmer, as general manager of the company. The title of general manager will lapse and Mr. Radford will take over the advertising, sales, credits, and the direction of the seven branches located in the big distributing centers.

The production of the company will remain under the direction of the production manager. The announcement was made by President Neal of the General Motors Company.

Do Capital Cars Need Maryland Licenses?

BALTIMORE, MD., Jan. 15—Motorists of this city and state are interested in the test case of a Washington motorist as to whether a motor car owned in the District of Columbia must have a Maryland license. The case will be argued by Attorney-General Poe of Maryland before the United States Supreme Court. Should the court decide in favor of the Washingtonian it will probably affect the motor laws all over the country.



Section of Claudel carbureter | Section of Rayfield carbureter | Section of Schebler carbureter

Review of the Carbureter Field

Showing the Improvements Made in the Past Twelvemonth

PERFECTION of the mixture at all speeds still remains the aim of the carbureter manufacturers and the majority of improvements put out by the leading carbureter concerns have been made with this as the objective point. Outside of this feature the principal changes which have taken place are in the nature of refinements more than in radical changes in construction. The more extended use of the hot-air type of carbureter, in which the air is heated as it passes into the mixing-chamber, is worthy of notice as it is a distinct aid in starting the car on a cold day after it has been standing for some time. Many manufacturers have taken up the idea as a new thing this year, and in two or three cases where a water-jacketed carbureter was used in previous years a hot-air fed carbureter has been adopted for the use of those who favor this method. In most cases the hot-air pipe is clamped about the exhaust pipe in order that the heat of the latter may be used to warm the air drawn into the carbureter.

Dash control has secured a large following for this year, practically all the large manufacturers taking it up as part of the regular equipment of their carbureters. This would seem to hark back to the old days before carbureters were made automatic and the regulations for the given speeds were made from the dash. The fitting is used now, however, not as a necessity, but as an added refinement to the automatic carbureter. The principal function of the fitting is to give an additional supply of air at high speeds where the mixture is not required to be so rich as at the lower. It is arranged in many cases so that the air supply is greatly curtailed when starting the motor so that the suction caused by the piston will be taken up by the gasoline nozzle almost entirely and consequently a rich starting-mixture will be obtained.

Accessibility of adjustments has to a large extent engaged the attention of the manufacturers during the past year. This has made itself evident in the fact that a large number of the manufacturers have moved their adjustment points from the sides and bottom of the carbureter to the top. Independent adjustments for low, intermediate and high speeds are also greatly in evidence, so that the amateur may readily adjust his own carbureter without difficulty in making the adjustments as they should be.

Improvement in the material used is another point which should be taken into consideration as it tends to increase the life of the instrument. All-steel needle valves instead of steel-tipped brass valves are used to some extent, while extruded metal has taken the place of the casting used for the body of the carbureter in at least one make.

The activity of the foreign manufacturer in this field can hardly be overlooked. Three very prominent makes on our market today are of foreign invention and that they are proving popular is shown in the interest taken in those exhibited at the show. These foreign carbureters embody principles which are to some extent different from the general American practice, but which are at the same time found in a few of the American makes. The use of ball check valves for the auxiliary air in place of the spring air-valve may be mentioned as the most typical of these features.

Taking the situation all together the carbureters are divided into concentric and offset float designs and the non-float carbureter. In the float section there are two types of float, the cork and metallic. The latter is generally made from spun brass. In the non-float type a ball check is relied upon to regulate the flow of gasoline from the tank. The feed and feed regulation up to the spray device are of elemental importance and may be taken up briefly.

The gasoline cannot well be fed directly to the spray or vaporizing nozzle as if this were the case the pressure of the gasoline at the nozzle would vary with the supply in the tank. The reason for this is that in the majority of cars the gasoline flows by gravity to the carbureter. If the depth of gasoline in the tank was 2 inches there would be a much less head upon it than if it were at double that height. A richer mixture would then be delivered when the tank was full than when it was empty. In order to overcome this the principal method employed is the float-feed. With this system the gasoline passes through a small tube directly from the tank into the float-chamber of the carbureter. As the level of the gasoline rises the float is lifted and when the correct level has been reached a small rocker-arm connected to the float operates a needle which enters the small tube and closes it, thus preventing the flow of any gasoline until the level has fallen a sufficient distance to lift the needle from the entrance of the tube and allow the gasoline to flow from the tank again. It is seen then that in this method the gasoline is fed as it is needed to keep the level in the float-chamber at the required height and that when the motor is not in use the gasoline will not be fed except insofar as the small quantity evaporated in the float-chamber necessitates.

Many makers of carbureters using the float-feed have come

to the conclusion that the supply of gasoline to the float-chamber must be controlled by some other means than the suction of the motor alone. An automatic raising of the needle-valve by means of a cam or other device has been adopted in some cases, while in other instances the multiple-jet principle has been adopted. In the latter case a series of two or more jets are used. When the motor is turning over slowly the gasoline is sprayed from one nozzle alone, but as it picks up the feed from the other nozzles joins the first and thereby increases the amount of gasoline supplied.

In the Schebler carbureter the needle is raised coincidently with the opening of the throttle by an adjustable cam arrangement. The needle-valve enters the spray nozzle at an angle and is held in place by means of a boss in the casting. It is fitted with a knurled head against which bears a rocker-arm. The rocker-arm or bell-crank lever carries a roller which bears against a cam on the throttle-arm. When the throttle is opened the cam bears against the roller, which causes the rocker-arm to turn about its fulcrum, thus lifting the needle-valve from its seat and augmenting the gasoline feed. This year a dash-control has been fitted to the model L carbureter so that the amount of air may be increased or decreased at will, thus enabling a skilful driver to secure the highest efficiency from his car and to run it more economically. The dash-control works by means of a bell-crank lever so arranged that it may be worked by a device on the dash. The air in this way is always under the control of the driver.

The Stromberg carbureter is made in three distinct types, namely, A, B and C. The A type is the original Stromberg carbureter brought out three years ago. Since that time, however, it has undergone a developing process and numerous refinements have been made. In its present stage it is fitted with a glass float-chamber and a metal float. It is water-jacketed around the mixing-chamber. Separate adjustment points are provided for high and low speeds in order to make the adjusting as easy as possible. The latest refinements and changes in this carbureter have been the addition of a dust-proof cap over the float-chamber, the removal of the gasoline-level regulating device from its position over the float-chamber, the fitting of a hot-air horn and starting device, the latter consisting of a shutter-valve in the hot-air horn combined with a cam which locks the auxiliary air intake in a closed position. This causes an increase of suction on the spray nozzle and an easy starting mixture is the result.

The B type of Stromberg carbureter is compactly designed. It was originally intended for use on smaller motors, but may now be adapted to motors of larger size. It is of the concentric type in contrast to the model A. This carbureter is not water-jacketed, but has this year been fitted with the starting device and the hot-air attachment. The new dust-tight cap has also been fitted over the float chamber. The carbureter has independent adjustments for high and low speeds, and is especially adapted to air-cooled and thermo-syphon motors.

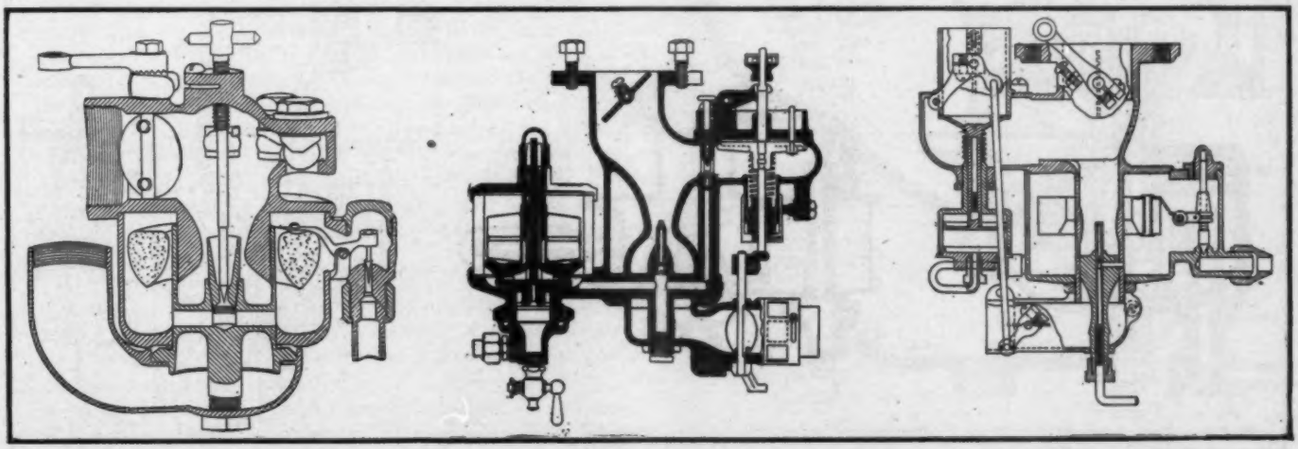
The model C Stromberg is of the double-jet type. It is especially designed for six-cylinder motors. This carbureter is water-jacketed and works on the same principle as the model A, the main difference lying in the fact that the double-jet is used in this carbureter. The second jet is automatically opened by the inlet valve. This is a notable feature. The latest carbureter of this type is fitted with the hot-air attachment and starting device which is described for the model A. The dust-proof cap is also fitted on this carbureter. Dash controls are now fitted to Stromberg carbureters.

The Kingston carbureter is of the concentric-float type. The float is of cork and governs the supply of gasoline by means of a lever pivoted in the body of the instrument, which controls the needle-valve in the gasoline intake pipe. The air valve passes through a restricted passageway of a modified Venturi form, and the spray nozzle is located in a transverse passage across the float-chamber. The points of adjustment in this carbureter have been made exceptionally accessible, being all located on the top of the instrument. This is the principal refinement in the mechanism. The auxiliary supply of air is governed by five balls located in the upper part of the carbureter. Additional suction of the motor owing to an increase in speed will lift the balls and increase the relative supply of air.

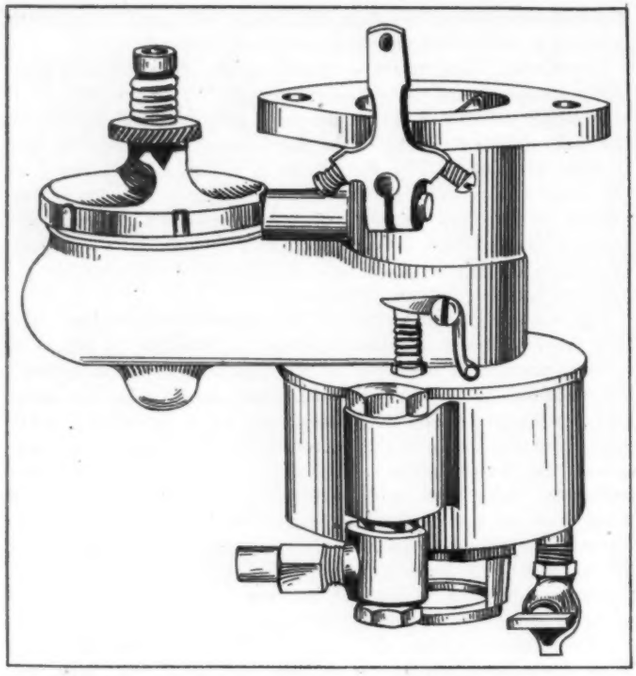
The Rayfield carbureter, made by the Findeisen & Kropf Manufacturing Company, is of the float-feed type, with the float-chamber eccentric to the spray nozzle. The adjustments on the carbureter have been rendered as accessible as possible, being all near the top of the carbureter. The mixing-chamber is water-jacketed and a dash adjustment for air at high speed can now be fitted to this instrument. The float-chamber is reached by extracting the screws which hold the dustproof cap in place. Dash control features this year's improvements.

The Mayer carbureter is fitted with what is known as dash-pot air control. The gasoline level is controlled by means of a a cork float in the usual manner. The hot-air pipe is led into the carbureter at the bottom and passes around the spray-nozzle. The auxiliary air-valve is of the butterfly type and the pivot upon which it works is also the pivot of the bell-crank lever which operates it. A rod is connected to the shorter arm of the bell-crank lever and fastened at the bottom of the body of the carbureter. When the auxiliary air-valve lever is moved the position of the dash-pot is changed and the size of the auxiliary air-port increased.

The Claudel carbureter is of the float-feed type with the float placed eccentrically. The carbureter is hot-water jacketed about the mixing-chamber and so arranged that the air is taken both through and around the jet. A tube surrounds the gasoline lead to the spray-nozzle and is punctured by holes at the bottom and top. The air passes into the lower tubes and comes



Section of Kingston carbureter Section of Stromberg carbureter Section of Mayer carbureter



Showing the exterior appearance of the Flechter carbureter

out at the upper ones, which surround the spray-nozzle. A starting shutter is fitted to this carbureter by means of which the air can be choked off to secure a richer mixture for starting.

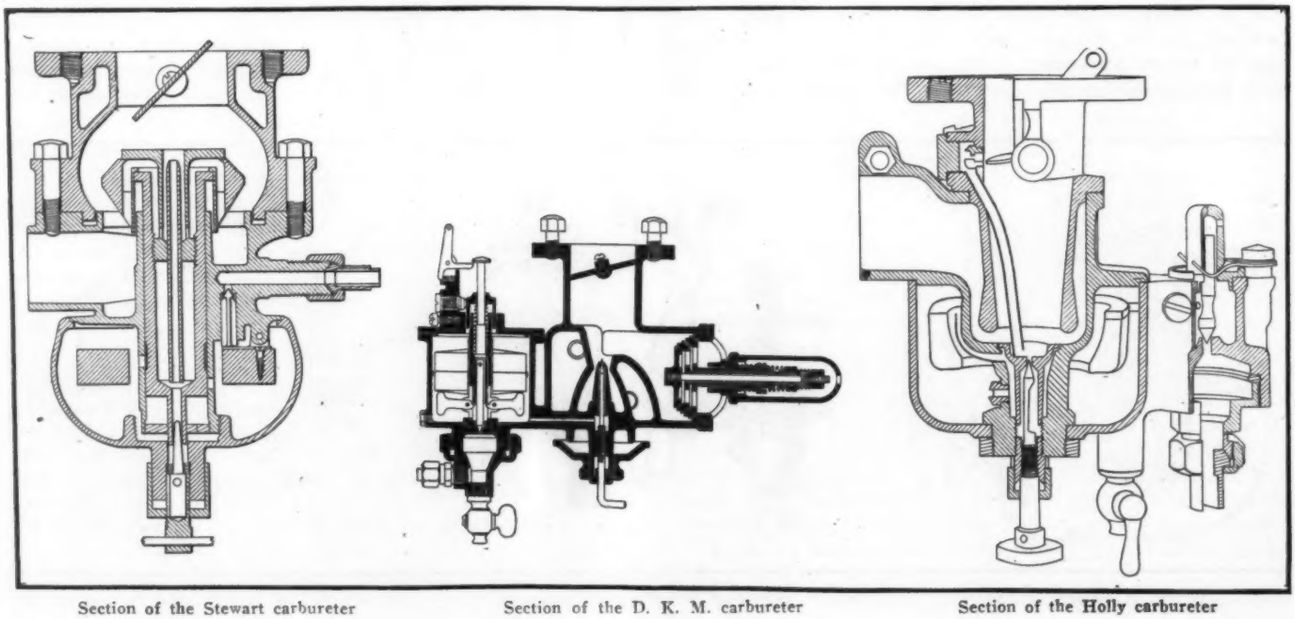
The Flechter carbureter is of the center-draft type with fixed gasoline jets. There have been several changes made in the newer carbureters of this type. The auxiliary air-valve bearing has been lengthened so that the life of that part is increased and wear minimized. There are two adjustments for the auxiliary air-valve; these are located concentrically on the top of the carbureter, forming the only points of adjustment and may be manipulated without tools. A new priming device has been fitted which operates by depressing the spun-brass float with which the carbureter is fitted. This primer is so designed that all parts of the float are equally depressed when the primer is used and any tilting of the float is avoided. For the rest, the carbureter is of the float-feed type with auxiliary air-valve operated by the suction of the motor.

The Bennett carbureter is of the concentric-float-feed type. The primary air supply is drawn through the ports provided for the purpose in the center of the carbureter. An auxiliary air-port takes care of the supplementary supply of air at high speeds. The Bennett differs from the standard float-feed type of carbureter in that a standpipe is employed for the purpose of allowing the air to pass through a number of restricted openings. The standpipe extends upward through the center of the air-passage. The perforations in the standpipes really perform the office of a multiple-jet carbureter when the motor reaches high speeds.

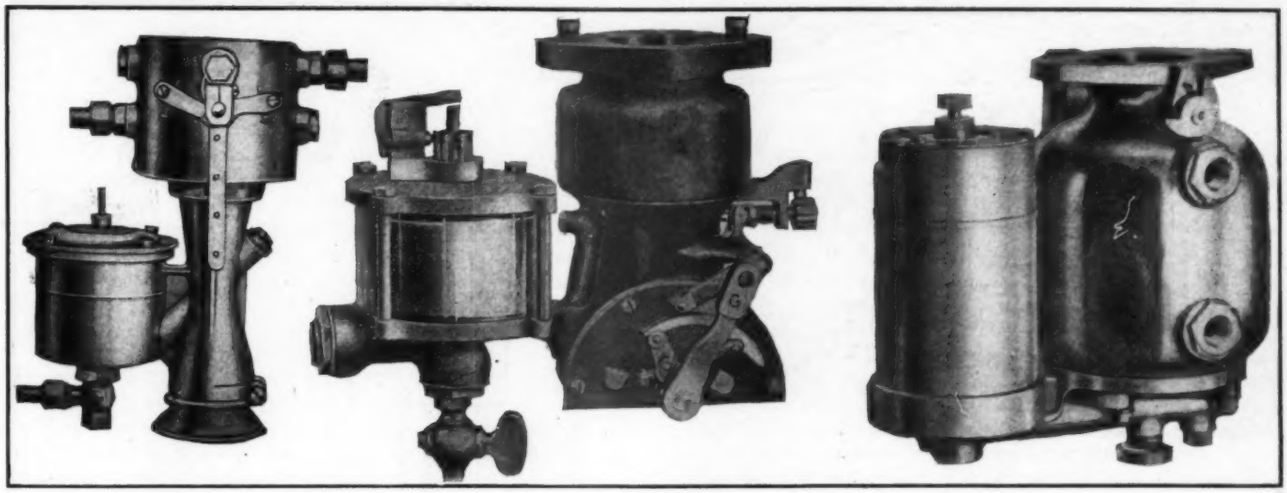
The D. K. W. carbureter is of the eccentric-float type. The points of adjustment are all exterior and readily accessible. The main air inlet is at the bottom of the float-chamber and the air is admitted around the spray-jet of the carbureter. As the speed of the motor increases an auxiliary air-valve of notable type responds to the added suction of the motor. The auxiliary air-valve is really three air-valves in one, the three being concentric. As the speed of the motor increases the first valve, having the weakest spring, will open, then the second and finally the third when the speed of the motor reaches a certain point. All three valves are open at the same time when the motor is traveling at high speed. There have been no changes made in this carbureter for the year of 1912.

In the Homo carbureter the gasoline lead from the float chamber opens into the mixing chamber being varied by a needle protruding from the opposite side of that chamber. The throttle is located beneath the nozzle and mixing chamber, so that the vacuum of the engine suction is efficiently made use of. The suction of the motor evaporates some gasoline streaming out of the nozzle, and together with the air entering from the throttle chamber is drawn through the Homo device consisting of a flange fitted in the carbureter passage and covered with a coarse mesh wire net, on the center of which five propeller blades are mounted. These are rotated by the mixture traveling toward the motor and the blades bring about a uniform mixture.

The Breeze carbureter is of the concentric-float type. There are but two adjustment points on the carbureter, one for gasoline and the other for air. The gasoline adjustment is so arranged that it cannot be turned too far, so that economy is in a measure compelled. The auxiliary air-valve is also on this principle, being so arranged that the tension on the auxiliary air-valve spring cannot be made so great that a sufficient supply of air will not be obtained. On opening the throttle the air from the auxiliary valve passes over the main supply and increases the suction at the nozzle.



Section of the Stewart carbureter | Section of the D. K. M. carbureter | Section of the Holly carbureter



The G. & A. carbureter The Homo carbureter The Newcomb carbureter

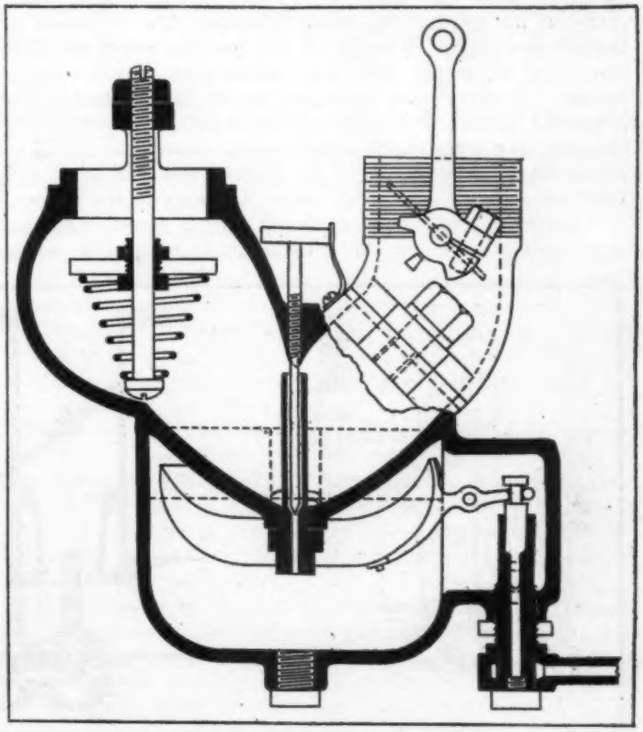
The G. and A. carbureter is of the Venturi type with the auxiliary air supply governed by a very ingenious system of balls of different sizes. There are twelve of these balls and the number and sizes of the balls lifted are governed by the speed of the motor and the suction caused by it. There are several features which have been improved in the newest type. They may be mentioned as follows: Gasoline lead from tank, and tapered entrance piece to float-chamber, widened. Extruded metal in place of brass for needle-valve mechanism, needle-valve all nickel-steel in place of brass with nickel-steel tip, ribs cast on body of instrument to form stops for the throttle-lever in place of the core-plugs which were formerly utilized. A valve for starting purposes which works by cutting off the air supply and thereby increasing the suction on the jet is now regularly fitted and the float-chamber has been rendered more accessible by closing it with three screws instead of four.

The Holley carbureter employs a double jet, the second or auxiliary being controlled by the auxiliary air valve. The main jet is within the Venturi passage and uses a needle-valve with a very convenient hand adjustment to vary the size of the opening. The second jet lies in the seat of the auxiliary air-valve so that the instant that the valve is lifted from its seat by the suction of the motor due to its running at high speed an additional gasoline-feed is obtained. The principle refinements lie in the greater facility of making the adjustments.

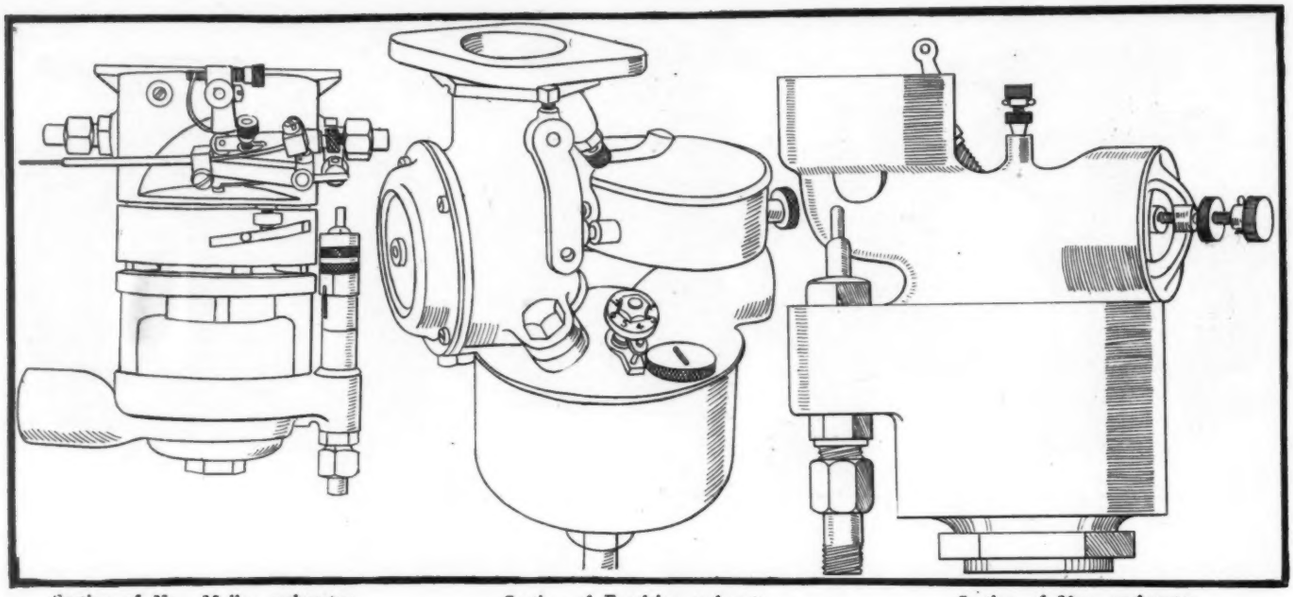
The Stewart Precision carbureter remains unchanged for the year 1912 except that a hot-air type has been added to the line for those who prefer this method of heating. This carbureter is now manufactured by the Detroit Lubricator Company, which expects to bring out a somewhat refined type in a short time. The carbureter is of the float-feed type. The suction of the motor lifts the air-valve, which is held down by gravity, and also sucks the gasoline from the float-chamber below. The lower end of the valve-stem extends down into the gasoline and the tapered regulating-pin projects into it. The higher the valve is lifted the more gasoline will be drawn up as the opening increases. The lift of the valve is always in proportion to the amount of air which passes through the carbureter. The air passes through drilled holes in the conical part of the valve and thence into the combining-tube, where it picks the gasoline from the end of the aspirator.

The Newcomb carbureter is made in two types, 1 and 2. The objective point of this carbureter is to provide an accurate mixture at all speeds by means of a metering device. The elementary feature of the carbureter is that it is of the float type, the gasoline-level being controlled by a hollow-metal float. The metering mechanism is in the vaporizing chamber and consists of a hollow plunger surrounding the pipe into which the gasoline flows from the float-chamber. There is a fuel-needle at the upper end of the plunger. As the plunger is lifted by the suction of the motor the needle-valve is lifted and increases the opening into the float-nozzle. There are a number of perforations in the plunger, and also a number of small air-ports which are covered by the plunger. When the latter lifts the air-ports are uncovered and more air is allowed to enter. The mixing-chamber is water-jacketed, thus aiding the evaporation. By means of an annular ring it is possible to raise the plunger and regulate the instrument.

The Zenith carbureter is unique in that it has two jets, main and compensating, concentrically placed. The openings for the two jets are in one spot, being coincident. The compensating jet is annular about the main orifice. There is a small groove in a well which is placed between the float and mixing-chambers, the float-chamber not being concentric with the spray nozzle. There is a small groove cut in this well, which terminates in a hole driven through the wall separating the well from the mixing-chamber. This hole is closed by the butterfly-valve



Sectional view of the Bennett carbureter



Section of New Muller carbureter | Section of Excelsior carbureter | Section of Maco carbureter

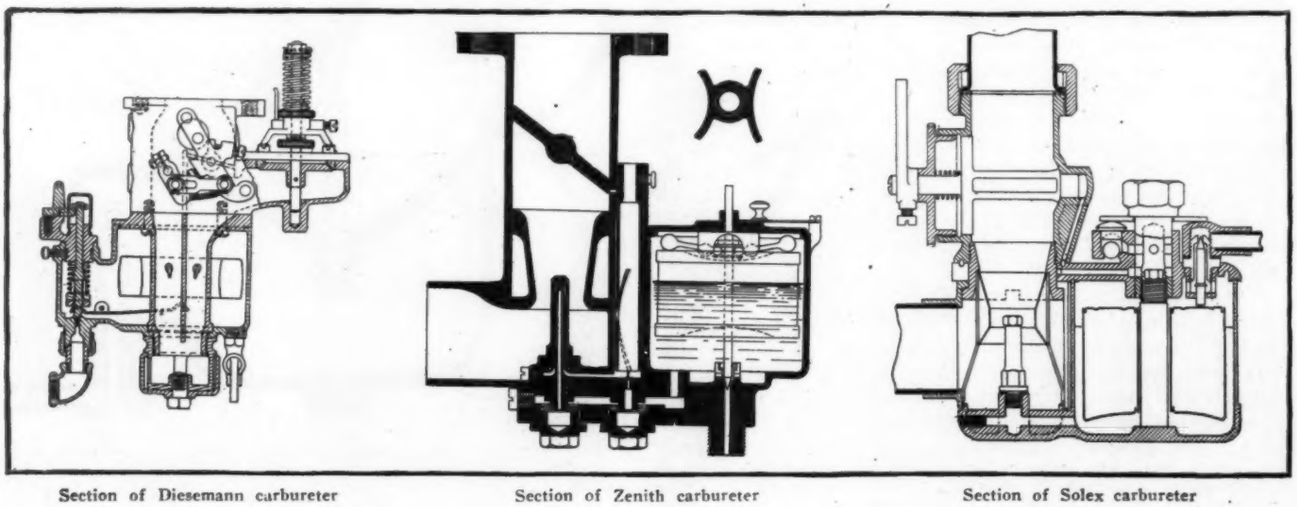
when the latter is in its closed position. Inserted in the well is a close-fitting tube which can be turned at will and secured in any desired position. This tube is drilled spirally. When the engine is started with the throttle partly opened the gasoline will be sucked from the well into the mixing chamber and the engine will start very easily on the mixture provided, as it will be very rich. When the engine is running normally this device has no effect. When the motor is running slowly with the gears out of mesh the device works in the same manner as when starting and provides the proper mixture.

The Excelsior carbureter is of the Venturi type with float feed. The spray nozzle is in the Venturi passage and the amount of opening of the nozzle is governed by a needle-valve. The outlet of the Venturi passage is restricted by a ball. The ball is drawn by suction toward the upper end of the funnel-shaped passage, thus allowing the area surrounding it to increase as the speed of the motor increases. The movement of the ball is regulated by means of two stop-pins which are fitted above and below the ball. The auxiliary air is governed by means of a spring upon which the tension can be regulated by a knurled screw. Two types of carbureter are made by this company, one jacketed, the other hot-air heated.

The Maco carbureter is of the Venturi type with cork concentric-float-feed. The spray nozzle is placed in the Venturi. The float-chamber is radial, so that it may be placed in any desired position to enable the gasoline intake pipe to be turned in any required direction. The needle-valve adjustment is at the top where it is most accessible and has the advantage that the needle-valve in this way assists in breaking up the gasoline spray. The auxiliary air-valve is controlled by a spring.

The Solex carbureter is a French importation. It is of the two-jet type and has an eccentric float-feed. The carbureter is automatic in its action. The auxiliary jet comes into action after the throttle has been opened to a certain degree, and is actuated by the increased suction of the motor. By unscrewing a single nut the entire carbureter may be disassembled, exposing both jets and permitting the removal of the choke-tube, with which the instrument is fitted. The automatic air-valve consists of a small bronze ball which is raised from its seat by the suction of the motor.

The New-Miller carbureter is of the concentric-float-feed type with independent adjustment devices. The gasoline connection is at the end of the vertical inlet tube to the float-chamber. The float-chamber is of glass and contains a spun-brass float. A removable hot-air connection is now fitted to the carbureter for use in cold weather. When necessary the air is taken from the neighborhood of the exhaust-pipe, so that it will be easy to start in cold weather. The principal feature of this carbureter is the ease with which any of the vital parts may be adjusted. Knurled screws are fitted for low throttling adjustment, high speed, intermediate speed, gasoline level and auxiliary air. The carbureter is water-jacketed. Dash control is a feature.



Section of Diesemann carbureter | Section of Zenith carbureter | Section of Solex carbureter

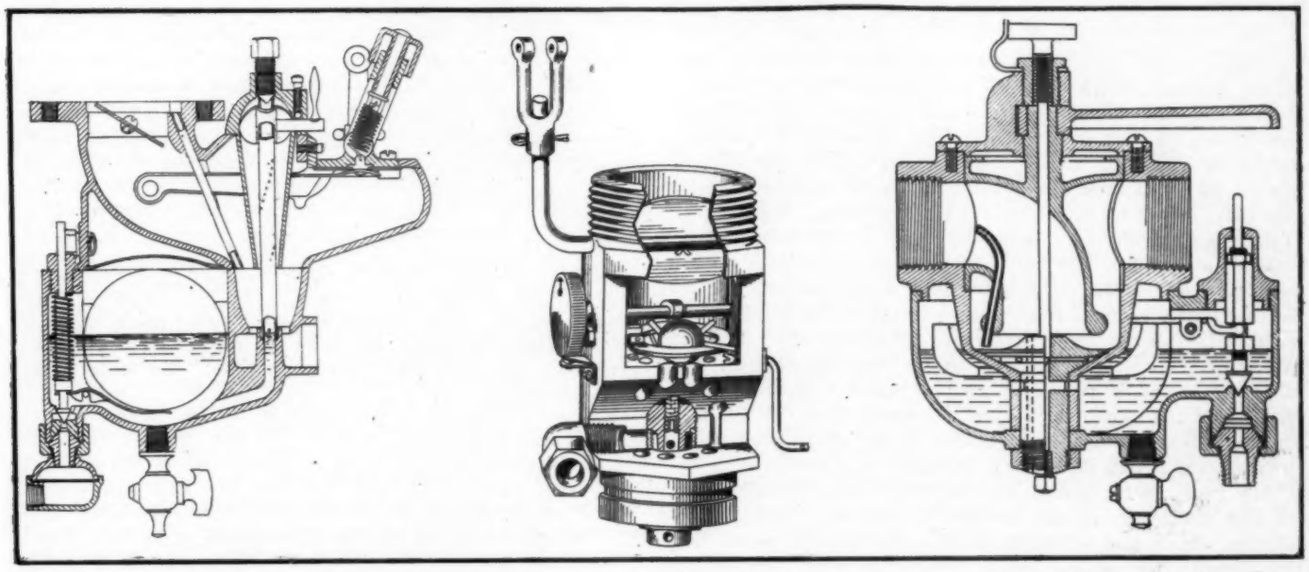
The Shain ball-spray carbureter is unique in that it has no float, the gasoline supply being regulated by means of a ball which fits into a seating that is so arranged that it will lift off its seat on the greater suction of the motor due to its increase in speed. The quantity of air is regulated at all speeds by the suction of the motor. The ball-sprayer revolves, due to the gasoline pressure under it and the engine suction above it, throwing up a thin spray of gasoline, which the air passing through the ten air-ports vaporizes. This carbureter, as may be seen, has no needle-valve and works only by suction.

The Diezemann carbureter is a concentric-float-feed instrument whose most interesting point is the fitting of two mixing-chambers. The gasoline float is of the metal type, the two mixing-chambers run vertically through the center of the carbureter and in each there is a spray nozzle giving a multiple-jet form. The nozzles are both located very close to the center of the float-chamber so that it is almost impossible to change the relative gasoline level at any normal inclination. The needle adjustments are made from the top of the carbureter, thus promoting accessibility. The throttle is of the double-butterfly type, so constructed that it opens the top of the first mixture-chamber and then, on the further opening of the throttle, opens the second jet. An auxiliary air-passage is fitted in addition to the regular straight-tube type. This is so arranged as to be absolutely automatic at all speeds. The float-chamber can be rotated about the body of the carbureter so that it can be fastened in the most advantageous position and then locked in this position.

The Carter carbureter is of the ball-float multiple-jet type. When a partial vacuum is created in the carbureter owing to the action of the piston air is drawn into the main opening and up through a circular opening around the lower end of the jet-tube. Gasoline is drawn through the lowest of primary jet and strikes the surrounding wall of the seat of the jet-tube, imparting a whirling motion to the gasoline which aids in the mixing process. As the throttle is opened further air enters through the auxiliary air-port and funnel. The gasoline rises inside the jet-tube and begins to spray out through the upper jets. The number of jets engaged varies with the speed at which the motor is running. In order that greater flexibility be obtained there is a dash-control fitted in all models by means of which the air-opening is varied at will. An anti-strangling-tube is fitted which comes into use at low speeds by means of which the mixing-chamber is kept dry and condensation at low speeds is avoided. The 1912 innovations are the new type of air-valve shown in the section and the gravity-controlled gasoline needle-valve.

The Krice carbureter is a small and compact float-feed carbureter whose distinguishing feature is the annular spraying principle employed in mixing the liquid fuel with the air. The gasoline enters the float-chamber through an opening which is controlled by the float-valve. The float-valve is operated by the float. From the float-chamber the gasoline enters the mixing-chamber through horizontal ducts and a vertical duct whose opening is regulated in size by a needle-valve and an annular crevice. This crevice is from .008 to .010 of an inch in width, so that the emerging fuel spreads out in a thin film which creeps up the walls of the mixing-chamber instead of being sprayed. The air for the mixture sweeps down over the walls and basin of the mixing-chamber, readily absorbing the liquid fuel and converting it into gasoline vapor. The vaporized fuel-and-air mixture then passes on out of the carbureter through the outlet which is connected to the inlet manifold.

The Acorn concentric-float-feed carbureter is of standard construction. The float governs the supply of gasoline from the motor, while the air is drawn through the bottom of the carbureter. The auxiliary air-valve is governed by a spring which may be set at any desired tension. As the motor speeds up the increased suction will open the auxiliary valve and the extra supply of air necessary at higher piston-speeds is thus supplied.



Section of Carter carbureter — Cut-out view of Shain carbureter — Section of Krice carbureter

The White & Poppe carbureter, a recent innovation in America, was exhibited at the Garden and attracted much attention. This is a float-feed carbureter with a very ingenious method of attaching and pivoting the roller weights of the float. The carbureter is fitted with a hot-air attachment which is heated by the exhaust. It is made in England.

The Gyrex is too well known to need very much in the way of description. A small bronze helical wheel is fastened in the Y part of the intake manifold. The gas in passing through the pipe sets the little wheel in motion, thus cutting up any of the globules of gasoline which are very apt to be present at low speeds. The blades of the little fan-wheel are perforated with a large number of small holes.

The Homo differs from all other mixers in that the fan-wheel which is operated by the inflowing gases is utilized to rotate the wire gauze to which it is attached. There are seven blades to the little Homo fan which are not perforated.

The Stanley mixer is also a gas mixer but instead of being fan-shaped it is a helical coil spring. It is fastened in the intake pipe.

Motor and Transmission for Trucks

Paper Read by Eugene P. Batzell, Member of the Society at the Annual Meeting of the Society of Automobile Engineers

THE matter of motor and transmission in commercial cars is not near to a definite settlement, which becomes apparent from a glance at the frequent motor sizes and transmission types. The latter could be taken up as an entirely separate problem, the complication fully warranting this, if one includes in the discussion the question of used and suggested transmission systems, involving different methods of obtaining a desired speed ratio between motor and driving wheels. But the question of necessary speed ratios, viz., gear changes, and of ratio values is closely interconnected with that of motor type and size, the solution of which in one way or the other affects accordingly the selection of suitable transmission ratios, intended to assist economical performance.

Motor Size

Judging from the motors generally used now for practically identical vehicles and for the same service, one must believe either that in one case the motor power capacity is greatly underrated, or that it is overrated in another. For example, taking the trucks of 6,000 pounds carrying capacity of different makes, they will show the greatest variety in motor sizes from 230 cubic inches up to 570 cubic inches in piston displacement. Taking account of the existing difference in the weight of the vehicles proper, and also transferring the piston displacement to an even piston speed, the above figures would indicate that the several trucks require, from their makers' standpoint, from 21 cubic inches to 38 cubic inches piston displacement for each pound of total weight—vehicle together with rated load. The difference noted is practically 80 per cent. There can be no doubt that this cannot be caused through constructive features only, which leaves open the question which size is correct, especially considering the general economy of the vehicle.

Any load can be carried over any road with a small motor, or with a big one, as long as there is sufficient traction at the driving wheels and a proper speed ratio between motor and the latter. The smaller motor would take more time to accomplish the work, one of the points to be considered when choosing motors for some service requirements. The requirements might be such that in some cases it would be fully justifiable to use a smaller motor for the sake of general economy, increasing inversely with the size, as long as the road and load conditions are light, with little chance of taxing the motor to its capacity in power development, or doing so but for a short time, which could not affect perceptibly the general result in service efficiency and promptness. When more severe conditions are expected to be dealt with, then it would seem proper to select a larger motor. Introducing such difference in motor sizes in trucks of the same make and capacity, is apt to evoke objections, but it should be borne in mind that a decrease of the motor size below that which could be used well only in extreme cases of service conditions means a great saving for the purchaser and owner. In fact, it is advisable to install in a given commercial car the smallest motor which is capable of rendering the service with best economy under the average prospective conditions, taking into account the time required as against the saving in initial, running, etc., costs, as compared with the larger motors.

FUEL ECONOMY AND POWER REQUIRED—When studying motor characteristics, particularly the fuel consumption curves, one notes that the minimum of the latter lies at comparatively high speed, 800-1200 revolutions per minute, depending on the construction and type, but action with full throttle opening only being considered. From the standpoint of fuel economy it would seem best to have the motors running at all times with wide open throttle and at a speed approximately equaling that of their corresponding minimum in the fuel consumption curve. The revolutions per minute frequently employed in practice for the rated normal vehicle speed favorably approach the above figures of most economical motor speed. This would assist in approximate figuring of motor size, because it imposes a limit upon its desirable speed. For instance, suppose that the easiest conditions to be figured on in a prospective service offer a tractive resistance of about 20 pounds per ton of weight; in the case of an empty vehicle this would require a moment at the driving wheels of 36-inch diameter, of 20 by 3 by 18 = 1,080 inch-pounds. Should the motor speed be limited to 1,000 revolutions per minute and that of the car to 15 miles per hour, the required highest ratio between the motor and the wheels will be about 7, which figure is often found in practice for direct drive. With a mechanical efficiency in the drive of 65 per cent., the necessary motor power can be

$$\frac{1080 \times 2\pi \times 1{,}000}{7 \times .65 \times 33{,}000 \times 12} = 3.75 \text{ hp.}$$

Similarly when the truck is carrying its rated load of 6,000 pounds over average roads with a tractive resistance of 40 pounds per ton and at a speed of 9 to 10 miles per hour, its required drive ratio would be about 10, if the motor revolutions per minute are somewhat lower than 1,000. The motor power at the same time is

$$\frac{40 \times 6 \times 18 \times 2\pi \times 900}{10 \times .65 \times 33{,}000 \times 12} = 9.5 \text{ hp.}$$

The last figure should disclose the great lack in general economy when trucks of the above type are equipped with motors rated at 30 to 50 horsepower at 1,000 revolutions per minute. Less than one-third of this power is necessary during most of their runs, which means that the motors are strongly throttled and accordingly work with very low efficiency.

Relative Cost and Operation Economy

It would be uneconomical to sacrifice the motor size to gain a trifle in the transmission construction, its cost and simplicity of operation. In the long run it is more satisfactory to have an economically working motor with experienced drivers.

In the former example the greatest tractive resistance should be assumed at 100 pounds per ton with the car ascending a 10 per cent. grade under full load. The vehicle speed during those abnormal conditions might well be reduced to 1 1-2 miles per hour. This lowest possible speed generally is to be determined by the character of the service in each individual case. The motor speed should be about 800 r.p.m., which gives the drive ratio at this moment equal to 57, or about twice lower than present practice. The motor power required during this run is

$$\frac{(100 \times 6 + 1{,}200) \times 18 \times 2\pi \times 800}{57 \times .65 \times 33{,}000 \times 12} = 11 \text{ hp.}$$

A motor of about 200 cubic inches piston displacement is ample for the above example, and its dimensions could be taken as any long-stroke combination, for instance, 3 1-2 by 5 1-2 inch.

Preserving the Car's Complexion

M. C. Hillick Tells How to Keep the Finish of the Varnish on a Highly Polished Automobile

AFTER a trip through the middle West extending as far as Atchison, Kan., the writer is prepared to say that negligent methods of taking care of the automobile are shuffling the cars to the scrap heap at an amazing rate. The particular feature of the care-taking business to which this article is devoted has to do with the preservation of the finish. With but very few exceptions, the finish and general appearance of the car are items unsurpassed in importance.

The delicacy of the colors used today and the sensitiveness of varnish to the various methods of cleaning the surface combine to make the problem of economically cleaning and caring for the finish and general appearance of the car a fairly universal one. As a rule car owners, both East and West, have been so busy with the mechanical details of the automobile that they have quite overlooked the no less weighty matters, and as a result there has been a constant and unmistakable deterioration of the painting and finish.

This business of keeping the car in a presentable condition—in maintaining its original depth of luster and brilliancy of color fields and its charm throughout—is not a matter of great difficulty when attended to in time, with that attention consistently applied as the days of service march past.

The first attention the automobile owner should devote to his car, as it comes to him perhaps a thing of beauty, with a fair promise of being a joy for a shorter or longer period, consists, or should consist, in giving the surface a frequent water bath. The value of this, of course, all depends upon how the water is applied. If doused on through a hose at high pressure the bath will do more harm than good and if repeated it will result in blighting the varnish and nipping the charm from the car.

The hose should never be allowed in the hands of an inexperienced operator and turned upon the finish of the car. Applied to the surface properly, water carried through the hose will do quite as well and can be handled more conveniently than water brought to the surface with a sponge, but the difficulty consists in not getting the water to the surface by means of the hose in a manner to remove the surface accumulations without detriment to the finish.

If carried through the hose the water should be allowed only a gentle flow. Supplementing this the use of a soft wool sponge will quickly get the surface refuse and dirt started. Then using a second wool sponge, give the surface a final rinsing to flood away any stray bits of foreign matter and to freshen up the luster and fetch out its befogged brilliancy.

Frequent Washing Preserves Varnish

In drying off the surface after giving it the needed water bath use a soft, lint-free wash leather, or so-called "chamois skin," and pass the leather over the finish lightly, just sufficient to nicely catch up the moisture in largest part, leaving a tracery of mist to dissipate upon exposure. Wash the car upon its return from the road and wash it as above described. If removed immediately such accumulations, with but few exceptions, will do the finish no harm. Left to their natural action and effect upon the surface, especially if permeated with moisture, they will extract sufficient oil from the varnish to deaden the finish in spots and give it a generally unkempt appearance. Ordinary road dust, either in town or country, is usually charged with a sufficiency of active and acrid matter to act injuriously upon the finish if left long on the surface. The matter picked up from city streets is as a rule more injurious than that common to country highways by virtue of the greater percentage of ammonia which it contains.

The freshly varnished car naturally is more sensitive to all the litter settling upon its surface along the ways of travel than the car less recently varnished, which is in itself an explanation why frequent water baths are in order and why the car upon coming in from the road should get its dose of clean water invariably. A gentle flow of water over the surface hardens the varnish and sharpens its luster and frees it from the enemies which destroy its just balance of ingredients.

Housing the Car

This, in a sense, is one of the most important items connected with the care-taking of the car. There can be all manner of ill-usage visited upon the car through the medium of improper housing quarters. First of all—speaking now of the absolute essentials—the car should be kept when not in use in a perfectly clean, dry, well-ventilated apartment, with enough natural light filtering into it to maintain the original purity of the surface colors and prevent the natural greening tendency of the varnish when deprived of the necessary volume of light.

Never locate the garage or storage space for the car adjacent to or even in the close neighborhood of the horse stable. Ammonia gases which germinate and thrive about the living-space of the horse are directly and insidiously fatal to the life and luster of varnish at any stage of its age.

Dampness and the ever-present dust and flocculent matter uniting upon the surface of the car form a harmful combination which more often than not results in varnish-spotting similar to the spotting resulting from the accumulation of mud on the surface. To prevent this arrange to fetch enough heat into the garage to dispel the dampness and take off the chill of the air. The temperature of the garage should not be kept too high; simply have the air warm enough to let the varnish live in a normal temperature so that it will neither contract nor expand to its eventual undoing.

Give the apartment plenty of light. Not only the colors, as noted above, thrive upon the effect of light, but the brilliancy of the varnish is promoted and maintained by the light of day. Of course, the glare of the sunlight concentrating through the window glass is an agency likely to weaken if it does not quite undermine the varnish. The windows of the garage therefore should be furnished with roller curtains so that at certain hours of the day, if necessary, the interior of the garage may be protected from the glare of the sun.

To sum up, then, in a brief paragraph the actual and indispensable needs of the garage or care-storage quarters, let us enumerate: An apartment isolated from and entirely independent of the horse stable or any building infected with ammonia or other deleterious mediums kept during the cold months at a gentle warmth with a dry, pure air circulating throughout. For the new car, or rather, the car with the new surface, no treatment is better or more natural than frequent washing. Varnish, and especially varnish that is in its prime or in a state of service leading up to its prime, is improved by water baths properly administered. Soft water is better than hard water and both are to be dried off, as previously noted, with a clean wash leather.

When the varnish will need a renewing and renovating medium applied to it other than good clean water depends altogether upon the care-taking methods given it.

Automobile Metallurgy Made Easy

By E. F. Lake

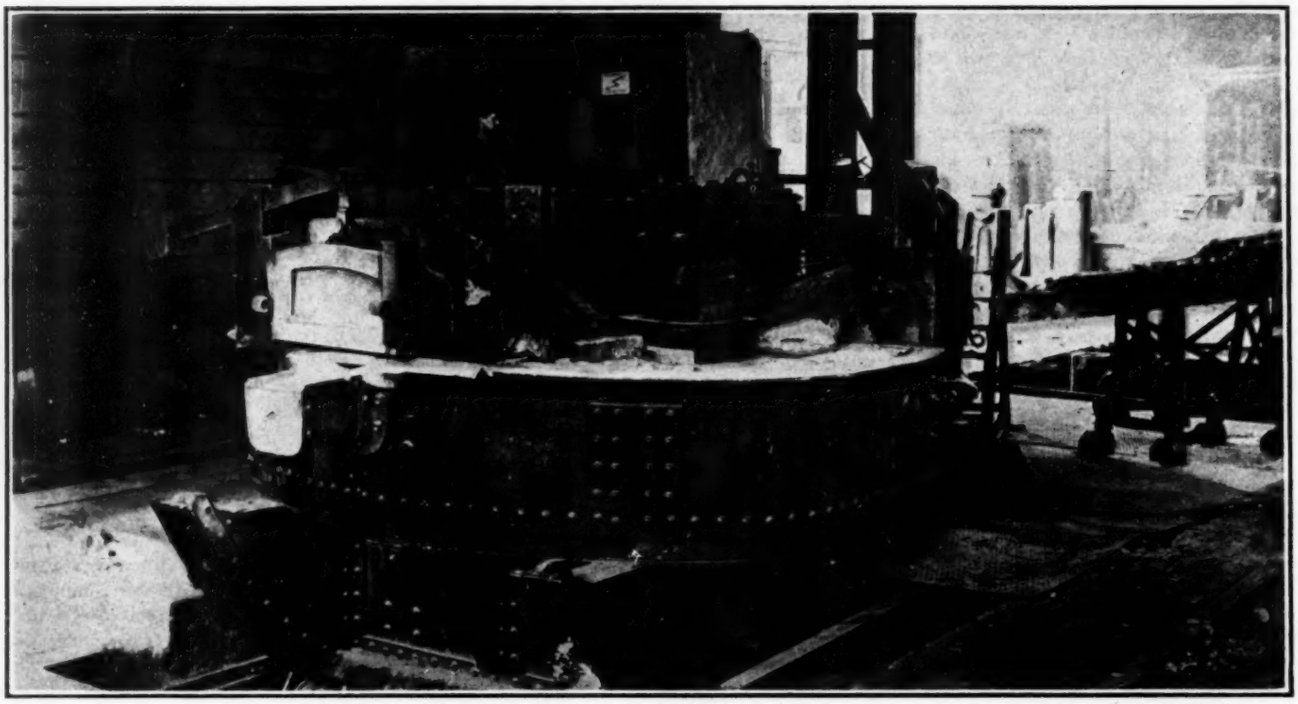


Fig. 1—Exterior view of the resistance type of electric steel furnace

Part IX
Electric Furnace Steel

(Next Week—Casting Steel)

THE electric furnace in which to make steel has now become a practical commercial success and is being used in most all of the countries in which steel is made. These furnaces might be placed in two characteristic classes, namely, the arc and resistance type.

In Fig. 1 is shown the exterior of a resistance type of furnace, while Fig. 2 shows a plan view of it. In this furnace the three coils generate the heat by sending an electric current through the molten metal which fills the furnace at A. With this heat the materials are melted, boiled and made into the finished steel. The material charged into the furnace may either be in the hot molten state as with the Bessemer converter, or it may be in the form of cold scrap, pig iron, etc., similar to either the open-hearth or crucible processes.

In the arc type of electric furnaces electrodes are used that are made of carbon. These are usually lowered through openings in the top of the furnace and when the current is turned on an electric arc plays over the top of the bath between the electrodes and thus produces the required heat.

In Fig. 3 is shown a vertical section of a single-phase resistance type of electric furnace. In this A is the annular crucible for holding the steel, B is a brick fire clay lining and K is the cover, C is the magnetic circuit and D is the primary circuit. This generates a current that passes through the bath of molten metal at A and thus gives the steel its required heat. If cold materials are charged in this furnace a solid ring must be provided to start the electric current and thus melt down the metal.

Molten pig iron from ore furnaces can be made into steel in the electric furnace. The main difference is in supplying the heat. While the electric furnace either causes an electric current to pass through the bath as in the resistance type of furnace or over it between electrodes as in the arc type and thus generate the heat, the open-hearth furnace generates its heat from gaseous or other fuels and causes the flames from their combustion to pass over the metal being melted, boiled and made into steel.

It can readily be seen, therefore, that with the electric furnace there is no danger of the steels absorbing any of the gases from the products of combustion which are prevalent in the open-hearth furnace. Therefore, the finished steel should be much freer from any gases of this kind than would any of the other steels, unless it be those made in the sealed crucibles. The electric furnaces can also be sealed up and covered so that very little air need be admitted to the interior of the furnace and thus the metal is not so liable to absorb gases from the atmosphere. This alone would give steels made in the electric furnaces an advantage over those made by other processes when density, strength, wearing qualities or any of the other mechanical properties are required to be brought to their highest point.

When a good ore can be procured steel can be made in the electric furnace, that is, the very highest grade of either the special alloy or ordinary carbon steels. These steels can also be given a higher degree of purity that it is possible to produce with any other process. One more important advantage which the electric furnace has over other steel-making processes is that it is easier to use two slags over the top of the bath during the steels purification. One of these slags can be made to remove the phosphorus and the other to abstract the sulphur. Thus the phosphorus and sulphur can be reduced to mere traces. While these have been reduced to quite low figures in the crucible fur-

nace they cannot be removed with near the entirety that they can in this manner in the electric furnace.

Sulphur and phosphorus can be removed to mere traces with both the open-hearth and crucible processes, but the time consumed and materials used are so great it makes the price of the finished steel prohibitive. When this is done in the electric furnace, however, only a small cost need be added to the steel. Bessemer steels have quite high percentages of these two injurious elements. Unless open-hearth steels are specially treated, their percentages are but little lower than they are in Bessemer steel. Crucible steels, however, are quite low in phosphorus and sulphur, but electric furnace steels are the best of all in this regard.

The cost of operating electric furnaces is being reduced as fast as the furnace and its apparatus becomes perfected. It is now at the point where it can produce the high-grade steels considerably cheaper than they can be produced in crucibles and also make them of a higher quality. Bessemer steels have even been made better by merely heating them up in an electric furnace for some time.

Electric furnace steels, therefore, are coming into use for automobile construction more and more every day. The various parts that require the highest grade of materials can well be made from electric steels. When thus made they need not have the high cost that crucible steel products do. The tool steels with which automobile parts are always machined are also much better when made in electric furnaces. While electric furnace steels are not plentiful enough at present to take the place of crucible steels in the manufacture of car parts, they can be relied upon for as good, if not a better, quality and in time will be cheapened in price and made in quantities sufficient to supplant crucible steels.

The strength properties that can be obtained from electric furnace steels are even greater than those that can be obtained from crucible steels. This is due to the fact that the impurities can be reduced to lower percentages and thus a more homogeneous steel made. For instance, the sulphur and phosphorus can be reduced to mere traces in the electric furnace while quite an appreciable percentage must be left in crucible steels, even though considerably lower than in steels made by the open-hearth or Bessemer processes.

Case-hardening steels with a carbon content of 0.10 per cent. have been made to show a tensile strength of 95,000 pounds per square inch, with an elastic limit that is over 75,000 pounds. Such a strength is very difficult to obtain by any other process of steel making. Steels used for railroad rails have shown a tensile strength of 119,000 pounds per square inch when made in the electric furnace, while this same steel gave only 97,000 pounds of tensile strength when made in the Bessemer converter. Ordinary carbon steels have shown 150,000 pounds per square inch of tensile strength and 120,000 pounds per square inch of elastic limit when made in the electric furnace. The elongation of this steel was 10 per cent. and the contraction 49 per cent. A low-carbon nickel-chrome electric steel gave a tensile strength of 231,000 pounds per square inch, an elastic limit of 217,000 pounds, an elongation of 8 per cent. and a contraction of 38 per cent.

It is not so difficult to make alloy steels in electric furnaces that will equal or exceed the 300,000 pounds per square inch of tensile strength that appears to be about the upper limit obtained in commercial steels. It is merely a question of using care, skill and materials when purifying the metal in the bath, and consequently electric furnace steels are bound to find more use for manufacturing into automobile parts than heretofore.

Fog Would Deprive London of Gasoline

LONDON, Dec. 2—The undue restrictions imposed by the Port of London Authority upon the landing of gasoline and all lubricating oils at Thames Haven, has caused considerable discussion in the motoring world. Sir Marcus Samuel, chairman of the British Petroleum Company, was among the first to protest, with the result that the Shell Company has been given sanction to store 80,000 tons of oil and spirit near the existing storage at Thames Haven. This concession almost proves that the projected monopoly has failed, thanks to the progressive action of the Board of Trade.

In the course of an interview Sir Marcus Samuel stated that in consequence of the Port of London Authorities' restrictions he and his colleagues had been obliged to lay down large refineries at a Continental port. He also expressed the hope that public opinion in England would take into account the practice with regard to motor spirit storage in New York and other big cities.

It is thought that the London County Council will take a broad view of the situation and, recognizing the extent to which diverse state and commercial interests are likely to be affected, approve more reasonable conditions for storage on a large scale. Before this improvement can be effected the river conditions—for which the Port of London Authority is responsible—must be less onerous and more in accord with the standard practice of American, Continental and certain British ports.

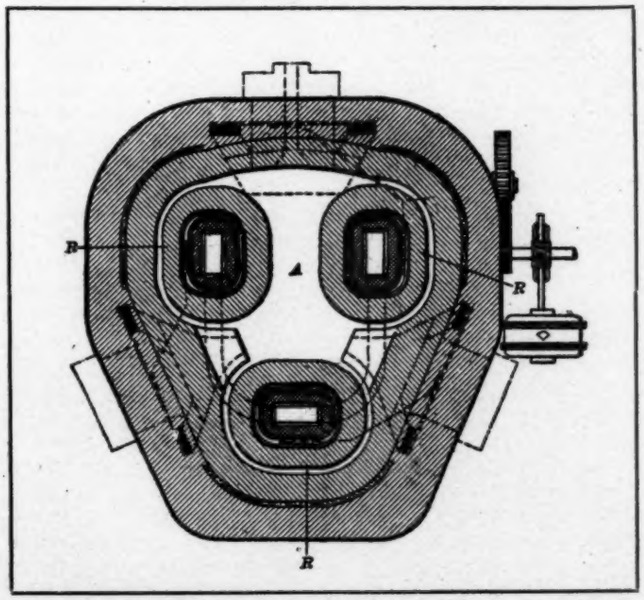


Fig. 2—Plan view of three-phase resistance of electric steel furnace

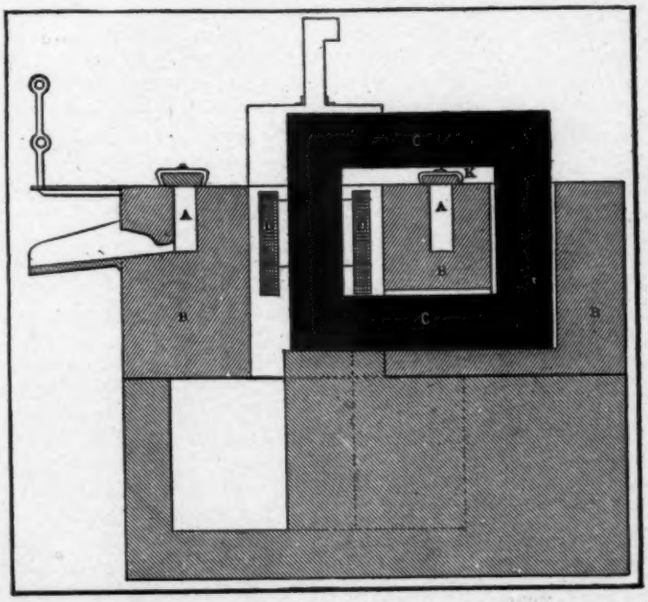


Fig. 3—Single-phase resistance type of electric steel-making furnace

Digest of the Leading Foreign Journals

How Tires Are Used Up

THE principal causes of the deterioration which finally sends a tire to the scrapheap may be summarized as regular wear of the tread, cuts, which may or may not reach the fabric, loosening of the rubber from the fabric or of one layer of fabric from another and bursting of the casing. Defects such as lack of parallelism between two wheels of a pair or lack of circularity in wheel or tire certainly affect wear greatly but need not be considered, as they should manifestly be avoided.

In looking into the normal causes of wear let it first be supposed that the road surface is perfectly smooth and hard. The wear of the front wheel tires is less complicated than that of the tires on the driving wheels and may be considered first. As they are pushed over the road without any other resistance than that determined by the very slight friction in the wheel bearings, the wear acting in the plan of the wheel may be considered negligible. On the other hand, there is a lateral action of the tire which involves friction. The tire is inflated to a section as shown in Fig. 1 in full lines. The moment it comes in contact with the ground it flattens under the weight of the vehicle and takes the form shown in the dotted lines. This deformation produces different effects at different points of the sectional contour. The sides are bulged out, and the tread is flattened exteriorly while arched interiorly—by reason of the thickness of the casing at this point. There is naturally considerable distension of the fabric, and strains between the rubber and the fabric, in assuming the new form, and the frictions involved are the cause of the regular wear of front tire casings. They heat the casing and the air it contains, and, as neither the rubber nor the fabric is perfectly elastic, it is a considerable portion of the work involved in the deformation of the tire which is transformed into heat. As the deformation is evidently greater, the greater the weight of the vehicle is and the less the tires are inflated, it becomes clear that at equal loads the regular wear of the tire will be smaller the more the tire is inflated.

It also becomes evident that the size of the tire should be chosen according to the weight it is intended to support. Let s be the area of the tire in contact with the ground, p the internal pressure and P the weight supported on the wheel. Then P always equals ps. Further, if a is the flattening of the tire in proportion to its sectional radius and A the absolute flattening, measured in centimeters for example, and r the radius of the tire section, the degree of flattening which takes place under different circumstances may always be expressed in the equation; a equals A divided by r. It is usually admitted that the value of a should never exceed 1-2, or in other words that a tire should never be depressed more than one-half of its sectional radius or 1-4 of its width, if excessive wear shall be avoided. It is easy to see that, if the inflation p remains constant and a is to remain unchanged, an increase of the weight to be supported, P, must be accompanied by a proportionate increase in the section of the tire.

As tire manufacturers, however, build tires to sustain a pressure increasing in proportion to the radius, or width, of the tire, the weight which a tire will support without exceeding the degree of flattening at which wear begins to become excessive increases in practice more rapidly than the section of the tire, provided the scale of inflation prescribed by the manufacturers is followed.

With regard to the driving wheels, the same causes for wear make themselves felt as on the front wheels, but other ones are at work as well. Experience shows that their tangential push against the ground causes a certain amount of slip. The rear wheel turns a little faster than a front wheel on the same car, and an examination of the rear wheel tracks, even on a hard and smooth road, usually shows some drag, while the pattern of a front tire is simply printed in the road surface. The strains upon the fabric of a rear tire are of course also more severe than those in front tires. Both the wear and the strains are aggravated by sudden starts and brake actions. But while sudden starting and brutal braking both may cause a grinding of the tire against the road surface resulting in much wear, there is the marked difference that, in starting, the wheel turns and all the points of the tire tread are ground successively against the same spot in the road, while in braking, if the wheel is blocked, it is the same point on the tire which is ground against a stretch of the road, and it is not rare to see a tire worn down to its fabric by a single brake action. In this respect there is reason for distinguishing between the so-called differential brake, or brake on the transmission, and the wheel brake. The differential brake, acting on the differential frame, does not necessarily stop the wheel movement but only reduces to zero the algebraic sum of the two wheel movements. One wheel may continue to turn forward if the other turns backward at the same time. And in practice the friction of the two wheels with the ground is seldom the same. One tire is usually worn more than the other. One carries a heavier load than the other. And the road may give better adhesion under one wheel than under the other. It follows that the two wheels will actually turn in opposite directions, and the nature of the wear will be the same as in the case of a sudden start. This result of applying the differential brake suddenly is especially likely if one of the tires is provided with an anti-skid band while the other is smooth, as on most of the Paris cabs. In this case it is the smooth tire which slides around where the ground is slippery and the anti-skid tire which turns back on the dry pavement, slewing the vehicle.

With the wheel brakes the case stands differently. Often one of the brakes, even if a compensating device is used, binds more than the other, simply because the braking surfaces are in different conditions; and then one of the wheels is stopped while the other continues to turn. The grinding takes place on the wheel which is blocked, and it happens frequently that anti-skid rivets are torn from the leather in which they are secured, especially if the anti-skid band is new and the rivets have sharp edges.

Wherever roads present marked inequalities of the surface, as they nearly always do, a new cause for tire wear comes into play through the bumps which the vehicle receives. It is difficult to analyze their exact effects, but they come under two heads: those due to the rebounding of the wheels and those which may be traced to irregular variations of the wheel speed. It is abundantly proved that any one of the four wheels, or all four of them, may leave the ground. In the case of front wheels, the coming back to the ground means scarcely more than increased flexion of the tire materials and the simple increase of wear and tear resulting therefrom. A driving wheel, however, while in the air, tends to speed up under the influence of the motor power, and when it strikes the ground again the effect is somewhat like that of a brake action; and this effect is aggravated if it is only one of the driving wheels which has left the ground. In the other case, when both driving wheels rebound, the vehicle can accommodate its own speed to that ac-

quired by the wheels in the air, rendering the effect only similar to that of a rough start. On the other hand, two tires are affected instead of one.

Other things equal, the wheels will rebound so much more as they are heavier and as the vehicle is lighter. Let p be the weight of the wheel and of the portion of the axle which it supports, and P the spring-suspended weight supported on the same wheel. The total weight resting on the tire is then $P+p$. Normally, or when the vehicle rolls over perfectly even ground, the tension of the vehicle spring equals the weight P.

Now, the wheel strikes an obstacle and passes over it. The tire flattens first; then, by virtue of its reaction upon the wheel, it tends to raise the latter by bending the spring. The tire then resumes its normal section, and the wheel leaves the ground with a certain vertical speed v. The momentum stored in the movement has the value $\frac{pv^2}{2g}$. [In which g is, of course, the acceleration of gravity, or 32.16 feet per second. The author prefers to introduce this formula in which distinction is made between weight and mass, but for the purpose of his argument g plays no part and could have been omitted. It seems self-evident that the energy consumed in raising the wheel and the portion of the vehicle moving with it in a spring-resisted vertical movement is determined by the weight of these parts, p.]

As soon as the wheel leaves the ground it becomes subject to the action of the spring, which equals the weight P—under the supposition that the tension of the spring remains about constant. Under this supposition, which is permissible to simplify the argument, the movement of the wheel is then uniformly retarded. The suspended weight P acts to reduce the momentum of the bouncing wheel until zero is reached at the top of the jounce. In other words, if h is the height of the jounce

$$(P+p)\,h=\frac{pv^2}{2g},$$

or

$$h=\frac{pv^2}{(P+p)\,2g}=\frac{v^2}{\left(\frac{P}{p}+1\right)2g}$$

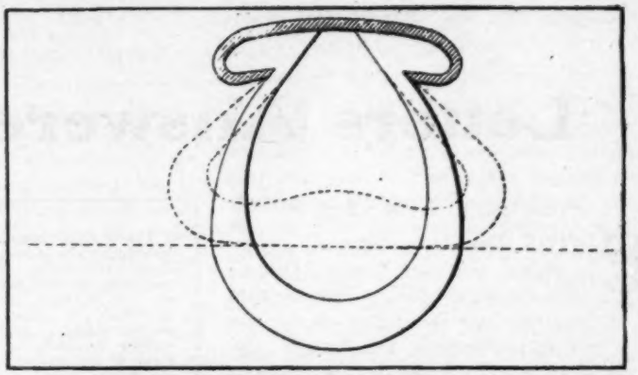
from which it is seen that the height of the jounce, h, varies with the quotient $P\ p$; which represents the relation between the unsuspended and the suspended weight.

[The author, according to his own formula, should say that the height of the jounce, other things equal, varies with the quotient p divided by $P+p$, which represents the relation between the unsuspended weight and the total weight of the vehicle.]

As the bounding of the wheels is what is considered in the question whether a vehicle keeps the road more or less well, road qualities and reduced tire wear go hand in hand. Provided tires of suitable dimensions for the total weight of the vehicle are used and the inflation is maintained in each case as it should be, the road qualities will be better and the tire wear smaller the heavier the vehicle is in proportion to the unsuspended weight, the latter comprising the wheels and axles and such other parts which rest on them and reciprocate with them rather than with the spring-suspended body and load.

[The fact that the wheel MUST rise above the height of the obstacle which causes a jounce, whether the superimposed weight is small or great, would seem to modify the law expressed by the author considerably, especially where rough roads are concerned, and it should perhaps also be taken into consideration that the most severe shocks received by a wheel seldom act vertically, being caused by obstructions in front of the wheel; and it is evidently within the province of constructors to modify the law further by providing a rapidly increasing tension in the spring suspension.]

In accordance with the foregoing, vehicles in which the rear axle carries the differential gear and part of the driving shaft will have a more rapid tire wear than chain-driven vehicles.



Showing flexions of casing which cause tire wear under all circumstances and especially when inflation is insufficient

But at this point some new factors enter for consideration. Even if the wheels did not rebound more, the tires would be used up more rapidly on a shaft-driven vehicle—understanding by this term only vehicles in which the differential is on the rear axle, but not those with the differential on a jackshaft and in which two lateral drive shafts are used. Let us examine what goes on when one of the rear wheels passes over an inequality. To be definite, suppose that the left wheel follows a horizontal surface and that the right wheel drops into a rut and then rises again to the normal level. While in the depression the right wheel moves a greater distance than if it moved horizontally. Its angular speed is greater than that of the left wheel, and, as the angular speed of the differential frame remains approximately constant by reason of the inertia of the flywheel and of the vehicle, the left wheel is in reality subjected to a brake action. In other words, the two wheels slip at the same time, one forward and the other backward. If the transmission took place by means of chains, this effect would be toned down, as chains always have some slack. Furthermore, when the right wheel passes into a depression the axle will lean to the right side, and with single-shaft drive, there will be some rotation of the large bevel gear around the driving pinion and consequently a variation of the angular speed of the wheels with relation to the speed of the motor. If the pinion is on the right side of the bevel gear, as usual, the wheels will slow down when the axle leans to the right and will speed up when it leans to the left. The effect will thus under all circumstances take the form of the scraping of rubber on the road surface. But if the rear axle is not a driving axle, no such effect is produced. With chain drive there will be no extra wear of tire unless the chains are too tightly adjusted.

The inertia of the wheel itself finally influences the tire wear. As mentioned, the passage of the vehicle over any inequality, be it hump or hole, produces a variation in the angular speed of the wheel affected, whether the wheel is driver or carrier only. The heavier the wheel is the longer time it will take before it can get back to the speed at which it is in accord with the other wheels and may roll without slipping. To avoid such slippage it is, therefore, of advantage to reduce the weight of the wheel, particularly of the wheel rim, and this argument militates in favor of metallic wheels.

This exhausts those causes of tire wear which are active in straight-line travel. The highly important ones which come into play at turns remain to be analyzed.—From article by Henri Petit in *La Technique Automobile*, November 15.

DURALUMINIUM HOTSHORT.—According to a note in *Revue de Chimie Industrielle*, the new strong aluminum alloy known as duraluminium, which is in this case described as made by adding to the aluminum 3.5 per cent. to 5.5 per cent. of copper, 0.5 per cent. of magnesium and 0.5 per cent. to 0.8 per cent. of manganese, is three times stronger than pure aluminum or the ordinary commercial alloys thereof; but it is hotshort, for at a temperature of 400 degrees centigrade its strength is reduced to one-half. It fuses at 650 degrees.

Letters Answered and Discussed

Presents a New Clutch

EDITOR THE AUTOMOBILE:

[2,994]—In your issue of December 7 you published an extract from a serial article by Ch. Faroux, in *La Vie Automobile*, illustrating the Renault and Hele-Shaw types of hydraulic transmission, in which the author takes the position that "The reduced speed of the driven shaft is generally obtained by a graduated slip in the action of the oil against the driven parts, which slip, however valuable for clutch and starting action, creates friction in the oil conduits and is consequently transformed into heat, but it is not delivered to the driven shaft in the form of power."

In a friction clutch, slippage transforms a portion of the energy into heat, which is wasted. The coefficient of friction decreases materially with slippage, and "slipping the clutch" is resorted to only to enable the engine to speed up and develop more power. The torque of the driven member is not increased by slipping the clutch, but by permitting the driving member to increase its torque.

M. Faroux has applied the same principle to the fluid clutch and assumed that if there was a certain percentage of slippage there would be a corresponding loss of power. As there would be some heating of the oil, he concludes that all the loss would go into heating the oil. To prove his position untenable, it is only necessary to consider the laws of fluid friction. Prof. Thurston, in "Friction and Lost Work," says: "For all fluids, whether liquid or gaseous, the resistance is (1) independent of the pressure between the masses in contact; (2) directly proportional to the area of rubbing surface; (3) proportional to the square of the relative velocity at moderate and high speeds, and to the velocity nearly at low speeds; (4) independent of the nature of the surfaces of the solid against which the stream may flow, but dependent to some extent upon their degree of roughness; (5) proportional to the density of the fluid, and related in some way to its viscosity."

The Editor invites subscribers to communicate their automobile troubles and personal experiences, stating them clearly on one side of the paper. If the nature of the case permits, send a sketch, even if it be rough, in order to assist to a clearer understanding. Each communication will receive attention in the order of its receipt, if the writer's signature and address accompany it as an evidence of good faith. If the writer objects to the publication of his name, he may add a nom de plume.

Trautwine, Art. 16, affirms the above statement, and adds: "Hence we have, for liquids, no coefficient of friction corresponding with that (resistance ÷ pressure) of solids. The resistance of fluid friction arises principally from the counter-currents thus set in motion, and which must be brought into compliance with the direction of the force which is urging the stream forward."

The creation of counter-currents or eddies would undoubtedly retard the flow of a stream and would only be considered in determining the velocity of a stream under pressure. Since viscosity, or friction between the fluid particles, seems to be considered negligible, we must look to the area of the rubbing surface and the velocity of the stream, in order to judge of the amount of fluid friction. The rapid circulation of the oil through long and tortuous conduits is the proximate cause of heating the oil. All clutches of the reciprocating piston type must necessarily produce heat, but the thermal loss would in no case amount to as great a percentage as the slippage. If it did, the oil would boil away.

In your issue of December 14, Forrest R. Jones has clearly explained "Transmission Ratio and Torque," as applied to the change-speed gears of the type ordinarily found on an automobile. His explanation is summarized in the terse statement that "the torques are inversely proportional to the rotative speeds." This principle applies as well to the rotary fluid clutch, whether of the reciprocating piston type or the type illustrated in the accompanying illustration (Fig. 1).

In the clutch illustrated the rotary piston 4 is mounted on the driving shaft 2 and rotates within the cylindrical casing 3, mounted on the driven shaft 1. An annular working chamber 13 is provided between the casing 3 and the piston 4, which are spaced apart. The rotary piston 4, carries four radially sliding valves 7, adapted to be withdrawn within the piston 4 and unlock the working chamber, or to be projected across the working chamber and block it. These valves are operated by the usual sliding sleeve through suitable means. The casing 3 is provided with three cylindrical recesses, in which are mounted the rotary abutments 5, provided with peripheral pockets 6, to permit the passage of the valves. The rotary abutments 5 are geared to the rotary piston 4 so that the peripheral pockets 6 register with the valves 7.

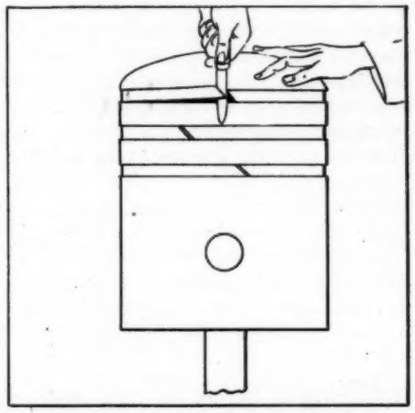


Fig. 2.—Method of removing piston rings

As mounted in the chassis of a car, the rotary piston has clockwise rotation.

In order to understand why this clutch fulfils the function of a speed-reducing, torque-increasing gear, the following explanation is offered:

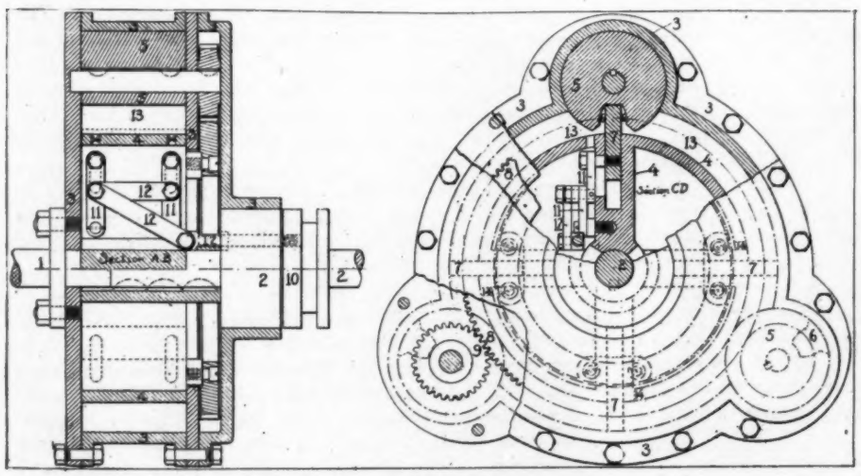


Fig. 1.—Type of fluid clutch showing annular working chamber

Action and reaction are always equal. The reaction of the fluid upon the driving member is equal to the action of the driving member, and the reaction of the driven member upon the fluid is equal to the action of the fluid.

Work is the overcoming of resistance through a certain distance, and comprises but two factors, force and distance. When we come to consider the relation between the force exerted by the driving member and the resistance exerted by the driven member, the force and resistance are both exerted at the same radius, or leverage, and for the same period of time, so that time is not an element to be considered. We do, however, need to consider the rate at which work is done, which is called power, and is equal to the product of the force times the velocity. If a force of 10 pounds acts through a distance of 3,300 feet in 1 minute and overcomes a resistance of 3,300 pounds through a distance of 10 feet in 1 minute, the products of the respective factors are in each case equal to the work done, 33,000 foot pounds, or one horsepower. The same power which will overcome a given resistance through a given distance, in a given time, will also overcome any other resistance through any other distance in that same time, provided the resistance and distance, when multiplied together, give the same amount as in the first case.

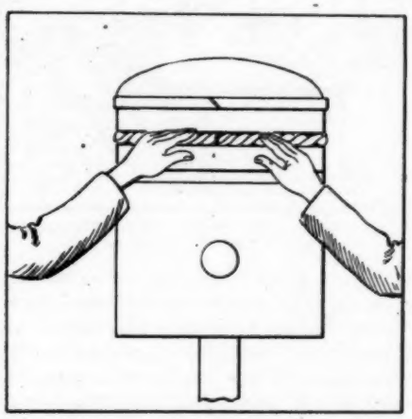


Fig. 3—Winding the piston ring groove with hemp

Distance may be resolved into velocity by dividing the distance in feet by the time in minutes, giving the velocity in feet per minute, and velocity will be better understood if expressed in revolutions per minute. Since torque, or rotary effort, equals foot-pounds per revolution, we may express the power of the driving and driven members by torque in foot-pounds times velocity in revolutions per minute. Let T and t represent the torques of the driving and driven members respectively, and let V and v represent the velocity in R.P.M. of the driving and driven members respectively. Then T times V equals t times v.

Assume the torque of the driving member to be .01 horsepower, the velocity of the driving member to be 1,000 R.P.M., and the velocity of the driven member to be 100 R.P.M. Then $t : T :: V : v$.

$$t = \frac{T \times V}{v} = \frac{.01 \text{ H.P.} \times 1000}{100} = \frac{10 \text{ H.P.}}{100} = .1 \text{ H.P.}$$

The torque of the driven member is ten times that of the driving member, or, in other words, the torque of the driven member increases in inverse ratio to the speed of rotation. To quote Mr. Jones, "The torques are inversely proportional to the rotative speeds."

When the valves are projected into the working chamber so that 9-10 of the oil is allowed to by-pass, the remaining 1-10 is used to displace the casing abutments.

As applied to an engine delivering 30 horsepower at 1000 R.P.M., the torque of the driving member would be .03 horsepower. If the velocity of the driven member is 10 R.P.M. its torque (resistance per revolution) would be 3 horsepower. This is equivalent to a gearbox and differential giving a gear reduction of 100 to 1. Since the greater torque is transmitted by the driven member I have used the casing as the driven member on account of its greater strength.

A greater horsepower may be transmitted with this style of clutch than with the reciprocating piston type. With a working chamber 10 inches in diameter, a rotative speed of 1,000 R.P.M., a working chamber 1 inch by 5 inches in cross section, and a pressure in the working chamber of 200 pounds per square inch, using one valve and one rotary abutment, we have the following power transmitted: Ten-twelfths is the diameter of the working-chamber in feet. The circumference of the working-chamber is, therefore, 2.618 feet. Since the valve exerts a pressure of 200 pounds per square inch the total pressure is 1,000 pounds. A pressure of 1,000 pounds exerted through a distance of 2,618 feet in one minute (2,618 feet being the distance traveled by the valve in 1,000 revolutions) is equivalent to 2,618,000 foot-pounds per minute, or 79 1-3 horsepower. The power may be increased by increasing the relative number of valves and rotary abutments or by increasing the pressure, or both. It is obvious, however, that the clutch need not be so large, nor the pressure so great, to transmit the power of the average automobile or truck motor.

This clutch is capable of complete engagement or disengagement. It neither grips nor slips, but gives a cushioned drive at all speeds. It is oiltight, dustproof and foolproof.

It may be placed next the engine and used with a sliding-gear transmission. It would be better to use an ordinary boat reverse gear between this clutch and the engine, and thus avoid all danger of stripped gears. On account of its gradual engagement it is kind to the tires.

J. C. CARPENTER.

Houston, Tex.

How to Paint an Automobile

Editor THE AUTOMOBILE:

[2,995]—will you please give me directions how to paint an automobile (aluminum) body, from priming coat to finishing coat of dark blue, also running gear dark gray? Please give approximate quantity of raw materials it will be necessary to purchase, and the different applications of paint and rubbing down necessary to make a good job. Am not particular about time body would be wanted, but am going to see if I cannot do a first-class job myself. Body is a five-passenger torpedo, chassis 122 wheelbase with 34-inch wheels. J. R.

Chatham, N. B.

See pages 246 and 247.

Also Loses Compression

Editor THE AUTOMOBILE:

[2,996]—In your issue of December 21, in answering question 2,964, concerning lost compression past piston rings you advised the inquirer that if the piston rings were not bright on all sides he was losing compression. I wish to ask you what you can do for me? I have lost compression in all four cylinders, but, unlike the inquirer mentioned, all my rings are bright and smooth as can be and all the valves are tight, but if I should hold the starting crank for even one second against compression all resistance is gone.

I find that the rings are open about 1-32 inch when in cylinder and they are quite a loose fit in the piston grooves, so that by shaking the piston they will shift their position on it. NEW SUBSCRIBER.

South Braintree, Mass.

If the compression leak is due to the looseness of the piston rings a good home-made repair, which has been mentioned in these columns before, but which might bear repeating, is shown in the accompanying illustrations. A thin winding of hemp is applied to the grooves of the piston and the rings are then snapped over them. The method of removing the piston ring is shown in Fig. 2 and winding and replacing in Figs. 3 and 4.

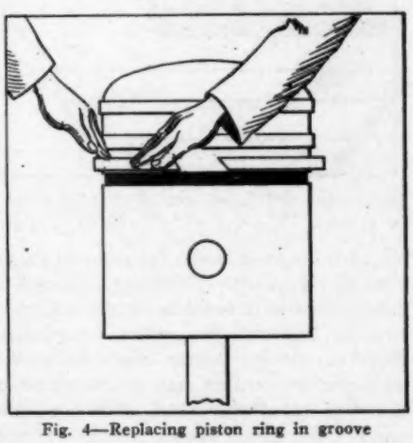


Fig. 4—Replacing piston ring in groove

Little Bits of Motor Wisdom

Pertinent Pointers of Interest to Repairman and Driver

REMOVING RUST FROM PARTS—In spite of all precautions there are occasions which are bound to arise in which the automobilist will be compelled to undertake the arduous labor of removing a thick deposit of rust. If the part is a small one the process may be greatly expedited if, before the elbow grease required is called into use, the part be soaked in a vessel containing kerosene oil, Fig. 1. This is a well known procedure, but the softening effect of the kerosene on rust is often expected to take place in too short a time and, instead of giving the part time to soak, the operator will very often undertake the work of removing the rust immediately after dipping the part into the kerosene. Two or three days should be allowed to the soaking process if this amount of time can be spared. If this is too long the part should be soaked over night at least. After the rust is softened in this manner the succeeding steps are very much easier as the stubbornness of the deposit will be to a great extent removed. After having soaked the part, in case it is small, or omitting this step if it is too large to be contained in any available vessel, the scraper should be called into use; that is, providing that it is a very thick coating which is to be removed and not merely a stained part.

The scraper used, as is shown in Fig. 2, consists generally of a flat-faced file which

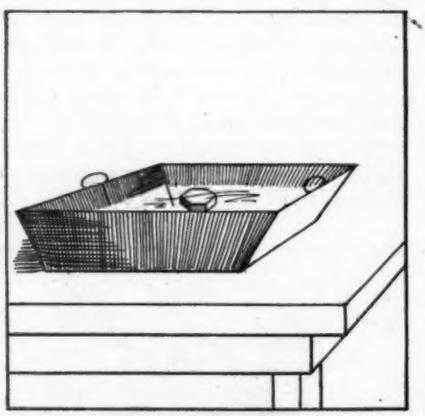


Fig. 1—The rusted part may be allowed to soak overnight in a pan of kerosene

has been turned down at the end and sharpened at this point. The scraper should be manipulated with one hand while a drop or two of kerosene is applied occasionally from an oil-can. If the rust proves very stubborn the scraper may be drawn along the surface of the metal with one hand and pressed tightly against the surface with the other. It will be found that the deposit will yield to this treatment no matter how stubborn it is or how long it may have been accumulating. The advantage of this scraping tool lies in the fact that the file part of the tool may be readily called into use in case parts of the metal are struck in which this part of the tool can more readily reach the desired spot than the sharpened edge. If the file part is used for the rust the teeth should be cleaned occasionally as there is apt to be an accumulation of the scales of rust in the file which will seriously hamper its cutting edge. As a rule it will be found better to use the scraper edge alone as there is no danger of this part clogging, and it is so shaped that there are very few parts, no matter how intricate the

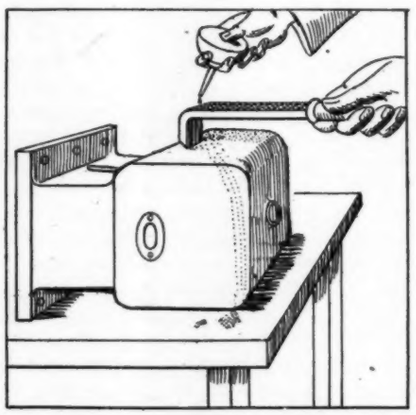


Fig. 2—The scraper is used in conjunction with a small can of kerosene

piece may be, that the scraper cannot reach as readily as any other tool. The advantage of using a tool of this nature which has been fashioned from a file is that the metal will be very hard and not at all apt to wear when used for these purposes.

After the piece has been thoroughly scraped so that it is bright in all spots which were previously covered with rust the part is wiped off with kerosene-soaked waste so as to remove the little rust particles which may be clinging to the surface of the metal. Dry waste is then called into requisition and all signs of kerosene removed from the part. Many advocate the use of steel wool as a means of removing any small particles of rust accumulation. This consists of steel waste which resembles a number of very thin ribbons of steel rolled into a ball. The ribbons are very narrow and hence there is a large amount of cutting surface for a given quantity of the wool. It is very good for surfaces in which particular care does not have to be taken that the smoothness of the surface is not marred. When the wool is used a little

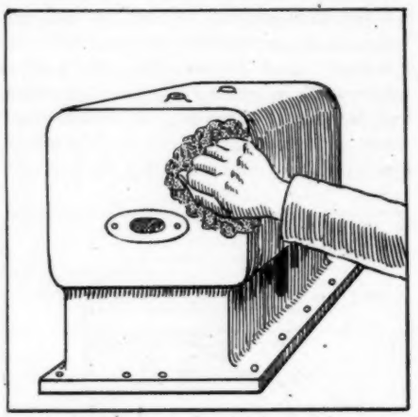


Fig. 3—All kerosene must be thoroughly removed before the emery can be applied

kerosene should be used in connection with it in the same manner as with the scraper. Indeed, the wool may take the place of the scraper where the accumulation of rust has not reached a high degree of thickness.

After the kerosene oil has been wiped from the surface of the metal the next process is to emery the part. There are a great many methods of getting at a piece of metal with emery cloth but none is better than that used commonly in the engine-room of large power plants where the emery cloth reaches the height of its usefulness. The method commonly employed here is to take a block of wood of such shape as to conform to the part that is to be cleaned. If the surface of the metal is flat the surface of the block of wood should also be flat while if there are curvatures which have to be manipulated the block of wood should also be shaped so that it can be utilized in getting around the curved portions of the piece of material. The method of fastening the emery to the block is very simple, consisting of laying the block of wood on the unfaced surface of the cloth and then bending this over the block and tacking it in place as shown in Fig. 4.

The emery should be of fine grade as there is no necessity for the coarser sort in most cases. It should be followed immediately by the paint if the surface is to be painted, or, if not, a coat of lubricating oil should be applied to the clean surface to prevent the collection of an oxide deposit.

PAINTING AN ALUMINUM BODY BLUE WITH GREY GEAR—First roughen the sur-

face of the body with emery cloth or coarse sandpaper. Then apply either a coat of metal primer bought ready for use, or a coat of brown oxide of iron pigment thinned to a smooth brushing consistency with three parts raw linseed oil and five parts pure turpentine, using a tablespoonful of japan to each quart of the mixture. If the coat is to be applied over an old paint foundation reduce the quantity of oil to two parts oil to six parts turpentine. Permit this priming coat to dry three days.

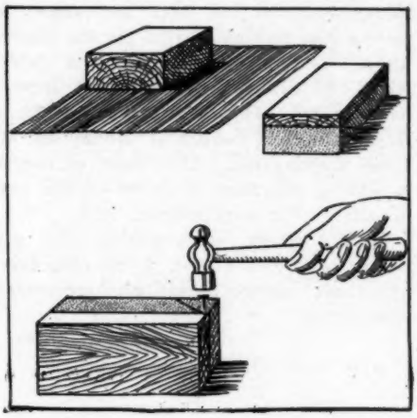


Fig. 4—Illustrating a good method of making an emery block for effective work

For a medium-cost job beat three parts dry white lead and one part keg, oil-ground lead to a glazing consistency in equal parts of rubbing varnish and coach japan, and with a broad, half-elastic scraping knife glaze the entire outside surface of the body, applying the pigment thin and evenly.

After 48 hours sandpaper this coat with No. 1 sandpaper, making everything as smooth and fine as possible.

For a better class job apply over the primer a coat of roughstuff filler made of equal parts, by weight, of keg, oil-ground lead and American roughstuff filler, beating these pigments to a stiff paste in coach japan and rubbing varnish, half and half. The next day examine the body and stop or face up any surface inequalities with some of the glaze putty already mentioned, using a little more whiting to stiffen the putty up some.

The following day put on a second coat of the roughstuff, and each succeeding day put on a coat, until five coats are applied.

Stand the body aside for a week and then rub the body of coarse paint down with rubbing brick and water to a smooth and uniformly level surface.

In the case of either class of job we now have the body ready for the first coat.

Sandpaper the surface lightly with No. 0 sandpaper, dust off and as a good ground for the dark blue apply either a coat of dark brown or of lampblack. Mix this brown or lampblack coat in one part raw linseed oil and five parts turpentine. Let dry 24 hours.

Then take some of the dark blue japan ground—of which there are many shades and names—and thin to a nice brushing consistency with turpentine, using one part oil to eight parts turpentine, and apply a coat.

Let this coat dry for 24 hours. Then make a color-varnish of the blue by using the pigment at the rate of 1-4 pound of color to 2 pounds of varnish. First thin the color with turpentine only. Then add the varnish. Apply two coats of this varnish-color, allowing one day to elapse between coats.

Flat the first coat with clean, curled hair obtained at an upholstering shop. Second coat should be rubbed off lightly with a soft, moist wool sponge dipped in pulverized pumice-stone.

Wash surface up and apply a coat of rubbing varnish into each pint of which stir 1-2 ounce of the body blue. Rub this coat after 4 days with pulverized pumice-stone and water, wash up thoroughly, and for a strictly high-class job apply a second coat of the rubbing varnish. If the body is to be striped apply the lines before putting on the last coat of rubbing varnish and do not add any color to this last

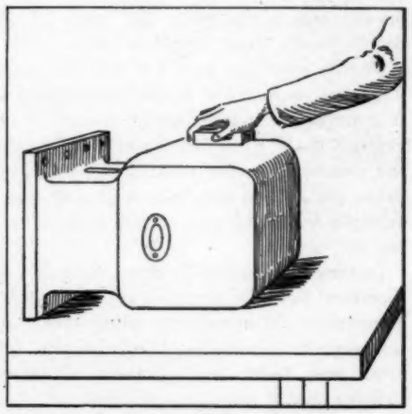


Fig. 5—Elbow-grease counts heavily when applying the emery to the rusted metal

coat. In the event of letting the body go plain use a few drops of blue color in the rubbing varnish. Clear varnish discolors and destroys the original purity of the blue, and a little color in the varnish preserves this purity.

After 4 days rub the last coat of rubbing varnish with water and pulverized pumice-stone, wash up and finish with a coat of elastic body-finishing varnish. For the chassis clean carefully with one part crude oil and two parts turpentine. Then sandpaper with No. 1 1-2 sandpaper.

Prime with keg, oil-ground lead, cast to a gray color by adding a little lampblack. Make the prime coat to contain three parts oil to five parts turpentine.

After 4 days sandpaper this coat, putty up all defects, and apply a second coat of gray pigment, containing two parts oil and six parts turpentine, adding, in both instances, a teaspoonful of oil to each print of the color. After 3 days again sandpaper the surface and apply a third coat of the gray mixture, using in thinning the pigment one part oil to six parts turpentine.

In the course of 2 days slightly sandpaper this coat, clean up and put on a coat of the final dark gray color.

Use a japan ground color, thin with turpentine and add one part oil to every ten parts of turpentine.

For second coat make a varnish color, using proportions as above advised for the body. In due time rub down lightly with curled hair and apply one coat of rubbing varnish. After 3 days rub this coat down with water and pulverized pumice-stone and finish with a coat of chassis-finishing varnish.

Pigments differ so radically in quality and composition that we can only give the materials, as follows:

Body.	
Primer	½ gal.
Putty glazing	6 lb.
Sand paper	12 sheets
Roughstuff	1½ gal.
Preparation color	⅛ gal.
Color	⅛ gal.
Varnish color	½ gal.
Clean rubbing varnish	3/16 gal.
Finishing varnish	¼ gal.
Coach japan	1/32 gal.
Rubbing brick	1 lb.

Chassis.	
Primer	⅜ gal.
Surfacing coats	½ gal.
Putty	½ lb.
Sandpaper	12 sheets
Color	⅛ gal.
Varnish color	⅜ gal.
Rubbing varnish	⅜ gal.
Finishing varnish	¼ gal.

Brushes suited to the above work: Primer, roughstuff and surfacing coats 5-inch round or oval bristle brush.

Color coats for body: 2-inch flat camel's hair brush.

Color coats for chassis: 1 3-4-inch flat camel's hair brush.

Varnish coats for chassis: 1 1-2-inch flat badger hair brush.

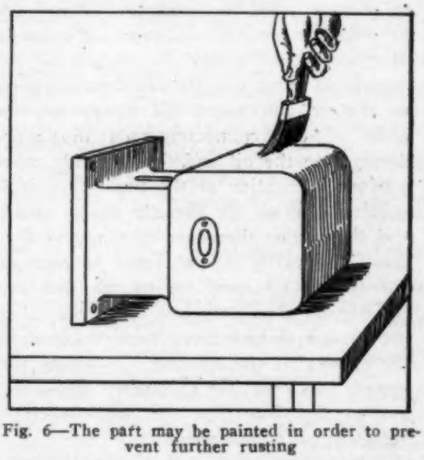


Fig. 6—The part may be painted in order to prevent further rusting

Varnish coats for body; 1-inch flat badger hair brush. Flat half-electric 2 1-2-inch bristle chisel-point brush.

Varnish color coats for body: Chisel-point brush, 1-inch and 2 1-2-inch Dusters: One flat gray bristle for body and one round gray bristle for chassis.

My Ideal 1912 Automobile

Readers' Conceptions of What This Year's Car Should Be

Vibration Damper Idea

EDITOR THE AUTOMOBILE:

The ideals which have been described in recent issues of THE AUTOMOBILE are comparatively easy of realization. Indeed there are quite a number of American cars on the market today which fulfill most of the conditions required by the writers. I am afraid that it will be more difficult to obtain my ideal, and I do not expect to see a car possessing the following characteristics for some years. Nevertheless, I think that readers of THE AUTOMOBILE will agree that many of the points mentioned below are in advance over present practice.

The motor would be of the Silent Knight slide-valve type having six cylinders cast in pairs. The bore and stroke would be 4 inches by 6 1-4 inches. The valve-operating shaft would be driven by silent chain with provision for taking up wear. The seven-bearing crankshaft would have a vibration damper fitted at its front end. This may briefly be described as a clutch which, while it serves to drive the fan positively, tends to slip internally when rapid irregularities of the crankshaft occur. The effect of this is to damp out the minute vibrations which are always likely to occur in the long crankshaft necessary for a six-cylinder engine.

The lubrication of the motor would be effected by hinged troughs. In this system, troughs in which a constant level of oil is maintained by six-plunger pumps, are provided under the big ends. Movement of the throttle varies the height of the troughs in relation to the crankshaft centers so that at full speed the dippers on the ends of the connecting-rods dip more deeply into the oil and thus provide more profuse lubrication at the time when it is required. With the throttle nearly closed and the engine therefore turning slowly a smaller quantity of lubricant is required and this is arranged for by the fact that the dippers then only just touch the oil in the troughs which have been lowered by the closing of the throttle. By using this system smoking is absolutely eliminated and at the same time the engine receives sufficient oil at all speeds.

Cooling would be accomplished by a gear-driven centrifugal pump. The radiator would be of the honeycomb type swung on trunnions so as not to be affected by twisting of the frame. The carbureter would be a Claudel multiple jet, with the air intake through the crankcase thus obviating the disagreeable hissing which is so noticeable on many otherwise quiet cars.

A Bosch high tension magneto, with double distributer would be used. I think it has been proved beyond all doubt that two-point ignition greatly increases the power of the motor. I should not include batteries as a compressed air self-starter would be provided. The self-starter would also inflate the tires, manipulate the pneumatic jack, and also supply pressure for the gasoline system. A 25-gallon tank would be located behind the rear axle, gasoline being fed by pressure to a 5-gallon tank on the dashboard and then to the carbureter by gravity.

In the vaned flywheel would be the clutch of the multiple disc type with about 41 discs alternately steel and phosphor bronze. The gearbox would contain four forward speeds and a reverse. The ratio of the direct fourth speed would be about 3 to 1.

Worm would be used for the final drive. This type is superior to the bevel gears as it remains silent indefinitely instead of becoming noisy in a few months. I prefer the overhead to the underhung worm because the ground clearance is greater and a straight line drive is obtained without raking the motor.

Internal expanding brakes, 18 inches in diameter would be fitted to all four wheels. A pedal would operate the right front and left rear brakes and a handlever the left front and right rear brakes. Diagonal braking would minimize skidding. Rudge-Whitworth detachable wire wheels 935 by 135 millimeters (36.8 by 5.3 inches) would be employed. The tires would be French Michelin flat-tread.

The car would have left-hand drive with center control. There would be three pedals: Service brake to the left, small accelerator pedal in the center and clutch pedal to the right. The height of all the pedals and the angle of the steering-column should be adjustable. There would be corrugations on the underside of the 16-inch steering wheel to afford a good grip. The spark and throttle levers would be on top of the wheel to the right of its center.

The front springs would be semi-elliptic, 42 inches long and the rear three-quarter-elliptic 56 inches long. The rear springs would be fitted with Jacquet-Maurel shock-absorbers.

The wheelbase would be about 136 inches and the tread of course 56 inches. For the body I should choose an interior driven gunboat limousine as made by Kellner & Ses Fils of Paris. A Gray & Davis lighting dynamo would give power for the electric headlights, sidelights, and tail light, as well as for the lighting of the interior, illumination of the dash and steps. It would also furnish current for the Klaxon horn. The speedometer would be driven from the driving shaft and not from a front wheel. The front axle would be of H-section and behind it would be the cross steering rod. The frame, of course, would be narrowed in front of the dash to allow of a wide steering lock.

If the design, workmanship, and material were of the best, a car embodying the above features would give me perfect satisfaction.

JOHN JAY IDE.

New York City.

Exhaust Valves in Heads

Editor THE AUTOMOBILE:

I have read with much interest your readers' conceptions of the ideal 1912 car, and although very much of an amateur, I have decided to outline my idea of a little six. The motor should have six cylinders with long stroke and large valves. The cylinders should be cast in pairs and they should be cooled by a honeycomb radiator and a gear-driven centrifugal pump. The bore should be 3 3-4 inches and the stroke 5 1-2 inches. The exhaust valves should be located in the heads of the cylinders, and the intakes on the side, with ample means for the adjustment of the rockers and valve stems.

A G. & A. carbureter should be used, and the ignition should be by Bosch dual system. The lubrication should be by force feed and splash with sight feed on the dash, which would show the flow to each bearing. The drive should be by shaft, a four-speed selective sliding gear transmission and a cone clutch with cork inserts being used.

The front axle should be of the B. & L. Castor type and the rear a floating Timken. The wheelbase should be about 120 inches, and either 36-inch by 4-inch or 36-inch by 4 1-2-inch tires should be used. The car should be equipped with right-hand drive and center control, the clutch and service brake being operated by one pedal under the left foot. The front springs should be semi-elliptic and the rear full elliptic.

This car should sell for $2,800.

C. K. ENDICOTT.

Canton, Mass.

Harking Back a Decade

FROM *The Motor Review* of January 16, 1902:

S. T. Davis, Jr., was elected president of the Locomobile Company of America at its annual meeting last week. John F. Havemeyer is secretary and Thomas H. Thomas, treasurer. It was decided to take up $500,000 of common stock of the company, replacing it with 7 per cent. preferred.

The Chicago Automobile Club election resulted in choosing F. C. Donald, president; C. H. Tucker, first vice-president, and Everitt F. Brown, second vice-president. B. C. Buxton was chosen secretary and Samuel A. Miles was elected to the board of governors.

The Chicago Automobile Club is preparing a call for a club convention, the purpose of which will be the formation of a national organization on different lines than those suggested by the Automobile Club of America. The convention will be held during spring show week. The Long Island Automobile Club and the Massachusetts organization have been invited.

F. H. Elliott, secretary-treasurer of the Automobile Club of Syracuse has been busy for the past week preparing letters to various automobile organizations asking information as to conducting a race meet. The club has adopted the word "autogorium" to describe the place where automobiles are stored.

Continental European manufacturers have adopted the idea of inclosing valve gearing and cams for raising exhaust valves and using aluminum castings for crank and gear casings from the British practice as demonstrated in current models.

In the coming Paris-Vienna race it has been decided to draw the starting numbers by lot. It has been argued that a late start, following the other competitors in clouds of dust, would be equal to defeat.

The White Sewing Machine Company of Cleveland has decided to lengthen the wheelbase of its 1902 steam carriage from 66 to 72 inches. This will allow the passengers to take the kinks out of their legs. The carriage is equipped with a 6-horsepower engine driven by a flash-tube boiler.

Statistics of the recent Paris Salon show that 693 motor vehicles were exhibited. Of these 464 could be classed as pleasure vehicles. Motorcyclettes, tricycles and even quadricycles decreased materially in the numbers shown. There were fifteen steam vehicles displayed; forty-six driven by electricity and the remainder were hydro-carbon driven.

While the affiliation scheme of the Automobile Club of America is making way but slowly, the details of the plan being even yet unknown outside the few immediately connected with it, there is evidence of a rapidly growing demand for national union. So strong is this that any plan at all plausible and backed by responsible persons will meet with hearty and general support.—Editorial.

Calendar of Coming Events

Shows

Jan. 6-20.....New York City, Madison Square Garden, Annual Show, Motor and Accessory Manufacturers.

Jan. 13-19.....Milwaukee, Wis., Auditorium, Fourth Annual Show, Milwaukee Automobile Dealers' Association.

Jan. 13-27.....Philadelphia, Annual Show, First and Third Regiment Armories, Philadelphia Automobile Trade Association.

Jan. 15-20.....New York City, Madison Square Garden, Twelfth Annual Show, Commercial Division, Automobile Board of Trade.

Jan. 15-20.....Toledo, O., Annual Show, Terminal Building, Toledo Automobile Dealers' Association.

Jan. 22-27.....Rochester, N. Y., Annual Show, State Armory, Rochester Automobile Dealers' Association.

Jan. 22-27.....Detroit, Mich., Wayne Gardens Eleventh Annual Show, Detroit Automobile Dealers' Association.

Jan. 22-27.....Providence, R. I., Providence State Armory, Rhode Island Licensed Automobile Dealers' Association, Automobile and Accessories Show.

Jan. 22-27.....Dubuque, Iowa, Annual Show Dubuque Automobile Dealers' Association.

Jan. 27-Feb. 10....Chicago Coliseum, Eleventh Annual Automobile Show, under the auspices of the National Association of Automobile Manufacturers. Pleasure cars, first week. Commercial vehicles, second week.

Jan. 27-Feb. 10....Pittsburgh, Pa., Sixth Annual Show, Automobile Dealers' Association of Pittsburgh, Inc. Pleasure cars, first week. Commercial vehicles, second week.

Jan. 29-Feb. 3.....Scranton, Pa., 13th Regiment Armory, Second Annual Show.

Feb. 1-7.....Washington, D. C., Annual Show, Convention Hall.

Feb. 3-10.....Montreal, Canada, National Show, Drill Hall, Automobile Club of Canada.

Feb. 3-10.....Harrisburg, Pa., Third Annual Show, Arena.

Feb. 5-10.....Buffalo, N. Y., Convention Hall, George C. Fehrman.

Feb. 5-17.....St. Louis, Mo., Coliseum, Annual Show, Pleasure cars first week. Commercial vehicles, second week.

Feb. 10-17.....Atlanta, Ga., Auditorium-Armory, Atlanta Automobile and Accessory Dealers' Association.

Feb. 12-17.....Ottawa, Ont., Howick Hall, Annual Show, Ottawa Valley Motor Car Association.

Feb. 12-17.....Kansas City, Mo., Annual Show, Combined Association of Motor Car Dealers.

Feb. 12-17.....Troy, N. Y., Second Annual Show, State Armory, Troy Automobile Dealers.

Feb. 12-19.....Dayton, O., Third Annual Show, Dayton Automobile Club.

Feb. 14-17.....Grand Rapids, Mich., Third Annual Show.

Feb. 17-24.....Pittsburgh, Pa., Second Annual Show, Exposition bldg., Pittsburgh Auto Show Association, Inc.

Feb. 17-24.....Newark, N. J., Fifth Annual Automobile Show, New Jersey Automobile Exhibition Company, First Regiment Armory.

Feb. 17-24.....Minneapolis, Minn., National Guard Armory and Coliseum, Annual Automobile Show, Minneapolis Automobile Show Association.

Feb. 19-24.....Omaha, Neb., Seventh Annual Show, Auditorium, Omaha Automobile Show Association.

Feb. 19-24.....Hartford, Conn., Annual Show, Automobile Club of Hartford, State Armory.

Feb. 19-24.....Cincinnati, O., Annual Show, Music Hall, Cincinnati Automobile Dealers' Association.

Feb. 20-24.....Binghamton, N. Y., State Armory, Third Annual Show, Automobile Dealers' Association.

Feb. 20-28.....Baltimore, Md., Annual Show, Baltimore Automobile Dealers' Association.

Feb. 21-28.....Toronto, Ont., Annual Show, The Armouries, Toronto Automobile Trade Association.

Feb. 24-March 2....Brooklyn, N. Y., Twenty-third Regiment Armory, Annual Show, Brooklyn Motor Vehicle Dealers' Association.

Feb. 26-Mar. 2.....Elmira, N. Y., Second Annual Show, Elmira Automobile Club.

Feb. 26-Mar. 2.....Paterson, N. J., Annual Show, Fifth Regt. Armory, Paterson Automobile Trade Association.

Feb. 26-Mar. 3.....Quincy, Ill., Highland Park Stone Pavilion. Annual Mississippi Valley Show, Quincy Auto Club.

Feb. 28-Mar. 2....Davenport, Iowa, Annual Show, Davenport Automobile Association.

March 2-9.....Boston, Mass., Tenth Annual Show, Boston Automobile Dealers' Association, Inc.

March 4-9.....Denver, Col., Auditorium, Annual Show, *Motor Field*.

March 6-9.....Louisville, Ky., Fifth Annual Show, First Regiment Armory, Louisville Automobile Dealers' Association.

March 6-9.....Tiffin, O., Second Annual Show, The *Advertiser*.

March 12-16.....Syracuse, N. Y., Fourth Annual Show, State Armory, Syracuse Automobile Dealers' Association.

Meetings, Etc.

Jan. 18-19.....New York City, Madison Square Garden, Annual Meeting Society Automobile Engineers.

Race Meets, Runs, Hill Climbs, Etc.

April 27.....Philadelphia, Annual Roadability Run, Quaker City Motor Club.

THE AUTOMOBILE

Vol. XXVI Thursday, January 18, 1912 No. 3

THE CLASS JOURNAL COMPANY

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Entered at New York, N. Y., as second-class matter.
The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907.

Truck Progress in 1911

THE motor truck industry has made amazing progress during the year 1911, which progress is best evidenced by the machines of 1912 vintage at present on exhibition at Madison Square Garden and also those seen at the Grand Central Palace. The progress has not been one of horsepower, of adding to the cylinder bore or stroke, of making trucks bigger, but of progress in the real making and designing of trucks. The circus days of the truck industry are fast dying—those days in which it pleased the maker to produce a faster 5-ton truck than his competitors. The industry is settling down to bed-rock. The men in it are realizing that the truck industry is one of business, not enthusiasm. Enthusiasm there must be, but the business end is the long-lived, enduring one. A merchant buying trucks or delivery wagons today is not buying them for advertisement, but because they will leave him at the end of the year with a greater profit than if he had used horse vehicles. The coal man who has installed some trucks has done so because the truck is cheaper than horses; he has done so because hard business conditions of today demand the truck; he has done so because he sees that the end of the sphere of horse usefulness in many of the industrial fields is nearing, and that to be a good business man he must install the modern idea and get into the motor-truck delivery field.

Looking at the truck industry from the other side of the fence—from the buyer's side—not a few facts are very interesting. One big New York coal man admitted that he never imagined that he had enough money to buy trucks until his competitor had installed them, and then he suddenly decided that, money or not, he had to have trucks if he were to hold his business and gain his proper percentage of new trade. He discovered that business houses are becoming familiar with the quicker delivery made by motor trucks, and that many of them are requesting such delivery when placing rush orders. His big discovery was the total lack of horse efficiency during the recent ten days of zero weather and icy streets. The horse has been badly incapacitated; he has floundered around on the ice; coal deliveries have been delayed; in some cases orders have been cancelled; and it has been impossible for the coal dealer to take care of the natural increase in business due to the unprecedented weather. It has all worked for the benefit of the motor truck. It has given the big 5- and 10-ton machines the best possible chances to win their spurs and they have made good. Several merchants using horse delivery up to the present have actually asked for assistance from firms with motor trucks, and there are scores of cases on record where demonstrating trucks have made deliveries that horse vehicles were not capable of making.

Returning to the truck maker's end of the field, one of the most apparent steps of progress in the year has been in the matter of bodies. These have not been produced by the truck makers, but generally by special body builders. The steel body has made phenomenal strides. It is most apparent in bodies for coal dealers, for the brewery trade, for the ice dealer, and also for all forms of dumping bodies. The sheet-steel body is now seen in many special designs for gravity unloading. Each body is an engineering job. Instead of riveting the sheets of steel together they are united by electric welding, giving an exterior finish as smooth as that seen in the metal touring-car body; in fact, the exterior finish is one of the best evidences of the progress that has been made. Another use of steel is in stake bodies for brewery and express-company trade. The steel stake is a rectangular-section tube, which generally is electrically welded to the cross sill of the body. All cross or horizontal connecting tubes are electrically welded to the verticals, giving one of the neatest jobs imaginable. The truck industry deserves the widest credit for what it has done through its body makers in this particular line.

It is satisfactory to see the general landslide to governors for the engines, governors which will not permit of a crankshaft speed in excess of 800 or 900 revolutions per minute, according to the dimensions and design of the engine. A year ago many talked against the governor; their trucks were made stoutly enough to stand 15 miles an hour or faster. These people have seen the error of their ways. They have seen the weaknesses of their machines. They have also learned some most valuable lessons. As a result the governor is nearly omnipresent and those who have not already adopted it are making arrangements to do so. It is a necessity; in a word, it is the real protection that the truck maker has control of. Many governors today are not up to standard; the connecting mechanisms are exposed and if the driver so desires he can disconnect at any time; he can bend the connecting linkages and do several other acts to render the usefulness of the device *nil*. The more acute designers have enclosed and

thoroughly sealed all of the governor parts, making it proof against tampering by the unreliable driver.

The biggest problems truck dealers have to contend with today are those of installation. The days are nearly over when a buyer will purchase a truck simply because it has a gasoline engine in it. The buyer today is studying the field. He has to know whether a 2-ton, a 3-ton, a 4-ton or a 5-ton truck is best suited for his work, or if his system of delivery calls for vehicles of different carrying capacity. Cases are on actual record where dealers have flatly refused to sell trucks for certain work in which they realized that success would be impossible. This is the kind of dealer that is needed. This is what must be instilled into the heads of many salesmen. What is needed is an installation engineer. A man who is familiar with business life, a man who has all of the elements of transportation at his finger ends, a man who knows the ins and outs of street traffic; in a word, a business-traffic expert. Such a man can tell the manufacturer, the merchant, the wholesaler or any other person the kind of vehicles best suited to his needs. In nine cases out of ten the buyer does not know what he wants. You ask him how his present horse system was developed and he can rarely give you more information than that it simply grew from time to time as the shipping clerk or some one else saw fit and as the business expanded. With the installation of the motor truck things are different. Nobody connected with the firm knows exactly what is needed. They are all more or less ignorant of truck performance. They are all ignorant of what the different load-capacity vehicles are capable of doing. They are all ignorant of the points in connection with truck operation which make for economy. They are all more or less ignorant of the garaging end of the motor business. They are all ignorant of the maintenance department, and, in a nutshell, it is up to the truck maker and the truck dealer and the truck seller to give this information. This is one department which has been woefully neglected by many makers. They have all worked to produce trucks that will carry the load and that will stand up. In many cases they have succeeded; but with this done they are now up against the master problem, that of marketing their machines, marketing them in the field of highest efficiency, marketing them where they will produce repeat orders and marketing them where they will be of maximum economy to the owner. This is the big task; this is the task to which the truck sales manager must direct himself. It is not any more a matter of demonstrating how to climb a hill on high gear; it is now a cold business deal—a deal in which the salesman must be an educator in word and also in deed.

Dyer Basic Patents Approach Trial

TREMENDOUS in their import to the automobile industry are the so-called Dyer suits now rapidly approaching a crisis in the United States District Court of Southern District of New York. If sustained, the Dyer patents will affect every automobile making concern in the United States quite as emphatically as the Selden patent would have done had it been affirmed.

Suits under these patents were entered last summer against the Maxwell-Briscoe Motor Car Company, Winton Motor Carriage Company and the Locomobile Company of America, and last fall a similar suit was commenced against the Commercial Motor Truck Company, the makers of the Saurer truck, which has recently been merged with the Mack under the name of International Motor Company.

Various delays have been secured in the matter of filing answers in all these cases and the most recent stipulation provides for the completion of the answers next Monday. It is generally agreed, however, that another stay is likely and that the final action along this line will be taken early in March.

The complaints allege infringement of two exceedingly broad patents covering a type of automobile and a transmission mechanism. The courts are asked to declare the patents valid and infringed by the defendants and to prohibit them from making, selling or using cars equipped with the patented devices and for damages resulting to the owner of the patents by reason of such alleged infringement.

The patents are numbered respectively 885,986 and 921,963. The first named is a patent covering a type of transmission gear and was granted to Leonard H. Dyer, April 28, 1908. The ownership of the patent was transferred to the Enterprise Automobile Company, of Hoboken, N. J., and similar action was taken with regard to the other patent granted May 18, 1909, covering an automobile vehicle. This patent was first applied for February 3, 1900, and application was renewed September 22, 1908.

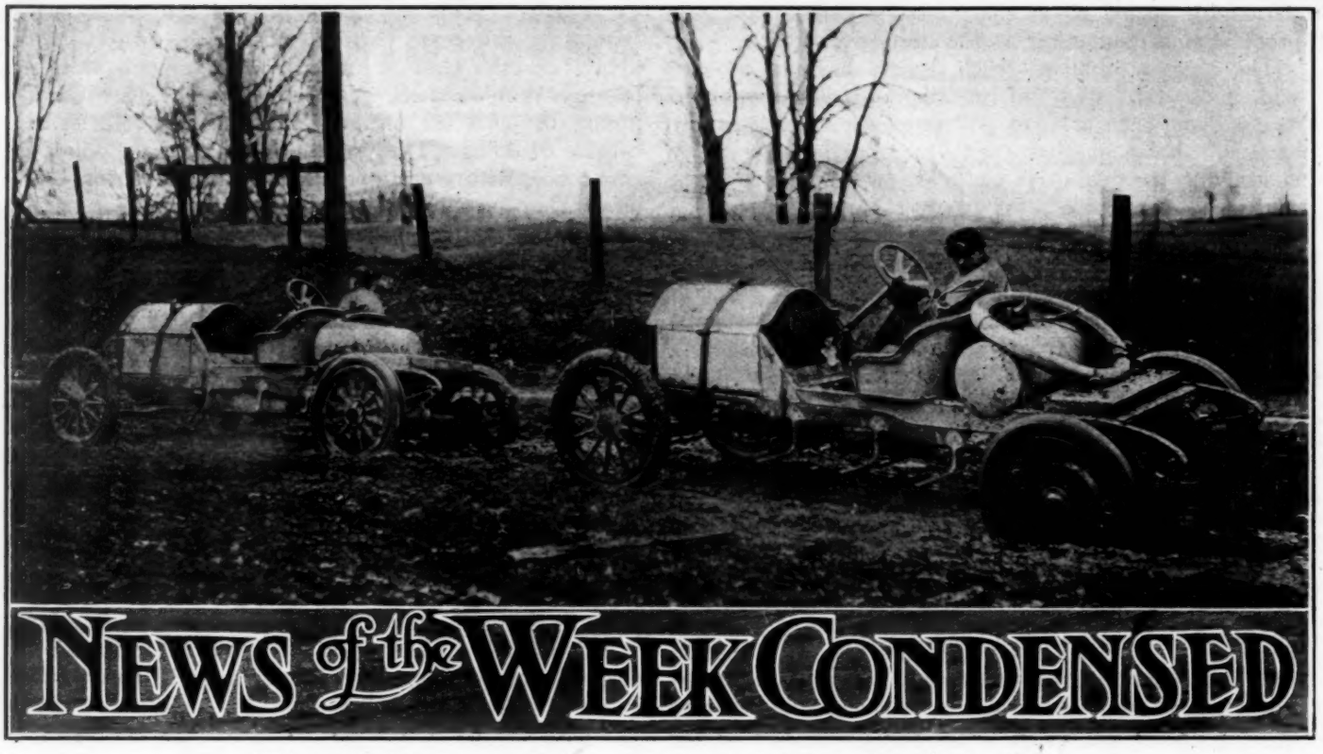
Patent 921,963 contains three specific claims. The first of these reads as follows: "The combination in a vehicle of a spring-supported frame, driving and steering wheels, a motor mounted upon the front of the frame, a shaft driven by such motor and in line with the shaft of the motor, the said shaft being longitudinally arranged substantially at an equal distance between the wheels and substantially parallel with the ground, a friction clutch connecting the shaft to the motor, a second shaft in line with the first shaft, means for directly connecting the two shafts for driving the second shaft without reduction in speed, means for breaking the connection between the two shafts and for connecting them together through power transmitting mechanism, affording a reduced speed, a differential gear between the second shaft and the wheels of the vehicle, and a reversing gear for reversing the direction of travel of the vehicle."

The second claim is almost identical with the first down to the words "affording a reduced speed."

The last claim is like the second, save that it contains in addition the following words: "And a reversing gear for reversing the direction of travel of the vehicle."

The other patent, number 885,986, contains fifty-seven claims. The first of these will illustrate how broad and comprehensive the patent as granted appears to be. Claim 1—"In a transmission gear for automobiles, the combination of a driving member, a driven member, a driving-gear for the former, a plurality of intermediate gears, including a reversing-gear and means, including mechanism shiftable as an entirety, for driving said driven member through any one of the said intermediate gears."

Claim 57 reads as follows: "In a transmission mechanism for motor vehicles; a casing, a driving shaft or shaft section projecting into said casing at one side, a bearing therefor in the wall of said casing, a gear and clutch part fixedly secured on or integral with said shaft section and entirely on one side of said bearing within said casing, a driven shaft in said casing having a movable complementary clutch part, a countershaft in fixed relation to said driving and driven shafts, and a plurality of gears on said shafts whereby varying speeds are transmitted to a shaft projecting from said casing."



NEWS of the WEEK CONDENSED

Cole cars are subjected to a most strenuous road test in all kinds of going before final O. K.

PHILADELPHIA—The International Motor Company, manufacturer of the Mack and Saurer trucks, has opened a branch here at 635-637 North Broad stret. H. P. Childs is manager with C. E. Collard and C. R. Hoyne as assistants.

NEW LEXINGTON, O.—C. C. Dillow & Son have taken the agency for the Buick in Perry county.

WILMINGTON, DEL.—The Wilmington Automobile Company has taken the agency for the Packard car in this state.

DES MOINES, IA.—The Brown-Corley-Ellis Company has taken the Des Moines agency for the Flanders colonial electric.

MONTREAL, QUE.—E. Major & Company, 35 St. Catherine street, west, have secured the agency for the Palmer-Singer Brighton six.

CHARLOTTE, N. C.—The Holmes garage has opened its doors to the public. This concern is doing a general automobile repair business.

YORK, PA.—J. B. Oden, 31 West Philadelphia street, will handle the Abbott-Detroit car in this city and vicinity during the year 1912.

HOUSTON, TEX.—The Franklin Motor Car Company, dealer in the Franklin car for this territory, has moved into its new garage in this city.

CHARLOTTE, N. C.—The Gooden Garage has been opened in the Settlemyer building on East Robinson street. S. A. Gooden is at the head of the concern.

PHILADELPHIA—At the recent monthly meeting of the Quaker City Motor Club the date for the annual roadability run of the club was fixed for Saturday, April 27.

BALTIMORE, MD.—Otto R. Beiler, formerly with the Carl Spoerer Sons Company, of this city, has taken the position of engineer and sales manager for the Lord Baltimore Motor Car Company.

CLEVELAND, O.—The new rim booklet of the Standard Welding Company is now ready for distribution. It contains descriptions of all the detachable and demountable rims made by the company.

PONTIAC, MICH.—Prisoners in the county jail at Pontiac will be hired out to the different villages and townships in the county. The men will be sent out under guards to do highway improvement work on the streets and roads.

CHARLOTTE, N. C.—Randall's garage has been opened on North Limestone street. The business will be conducted in connection with Randall's foundry and machine shops and will be located next to the foundry.

LANCASTER, O.—C. L. Fultz has taken on a line of light delivery wagons made by the Lincoln Motor Car Works, of Chicago, Ill. Mr. Fultz will distribute Lincoln cars in Fairfield and Pickaway counties.

PHILADELPHIA, PA.—The Sweeten Automobile Company, Franklin dealer, will hold a private exhibition of Franklin cars at its showrooms, 3430 Chestnut street, during the Philadelphia automobile show, Jan. 13-27.

BOWLING GREEN, O.—John W. Underwood has resigned his position as cashier of the Wood County Savings Bank, of this city, to take up his duties as one of the managers of the Bowling Green Motor Car Company.

TORONTO, ONT.—Hess & Meyers have taken the agency for the Ohio car in this city and vicinity. They have established a sub-agency at Massey, 400 miles north of Toronto. A garage and salesroom building, 50 by 150 feet, is being constructed on Richmond street for the company.

MONTREAL, QUE.—Some real "Old Country" passenger motor 'buses will be seen soon on the streets of Montreal. They are manufactured by the Vinot Company, of Paris, and a consignment of three of them is now on the way for the local Vinot agency, of which J. A. Michaud is the manager.

DENVER, COLO.—The automobile business of the MacFarland Auto Company, of this city, will hereafter be conducted under the name of the MacFarland-East Auto Company. The change of name is made in recognition of the services of James I. East, who has been associated with the company for the past 2 years.

SEATTLE, WASH.—Announcement is made by the Lozier Motor Company of changes in the distributing agency of the Lozier in this city. T. A. Davies becomes the president. T. C. Young, who for the past twelve months has been connected with the Pierce-Arrow Motor Car Company, becomes secretary and manager. The company is capitalized at $50,000.

SHREVEPORT, LA.—George H. Mills has taken the agency for the Cole car.

DOLGEVILLE, N. Y.—Redmond and Stewart Smith, brothers, have bought the Leon Rundell garage.

OCEAN SPRINGS, MISS.—H. F. Russell has been appointed Cole agent here by the Cole Motor Company, of Georgia.

MONTREAL, QUE.—The Regal Motor Car Company, of Detroit, Mich., opened a branch here on St. Lambert Hill, near St. James street.

TOLEDO, O.—M. M. Kennedy, of this city, has accepted the management of the distributing agency of the White Company in this territory.

WAPAKONETA, O.—The Elliott & Payne Garage Company, of Wapakoneta, O., has taken the 1912 agencies for the Overland, Matheson, Marion and Garford cars.

LOUISVILLE, KY.—During the past year 170 new members were added to the Louisville Automobile Club's roster. This carries the total membership over the 500 mark.

TOLEDO, O.—The Michigan Buggy Company, of Kalamazoo, Mich., has opened a distributing agency here and will in the future push the Michigan 40 in that territory.

LOUISVILLE, KY.—The local branch of the Ford Motor Company has moved from its temporary quarters at 437 South Second street to permanent quarters in its handsome and spacious garage and salesrooms at 931 South Third avenue.

ATLANTA, GA.—The Lockwood-Ash Motor Company will soon open a distributing warehouse in Atlanta. George F. Hardy will have charge of the Southern business with headquarters at 630 Edgewood avenue.

MINNEAPOLIS, MINN.—The Power Equipment Company has taken the Lion line of cars for distribution in Minnesota, North and South Dakota, Montana and Western Wisconsin. Robert Craig is manager of the new department and S. A. Wilson is salesman.

MOLINE, ILL.—J. F. Wamsley, representative of the Velie Motor Vehicle Company in South America, reports an order of 25 cars for spring delivery in the vicinity of Buenos Aires. The demand for automobiles has had a great increase during the past year in South America, and American cars are increasing in popularity.

MILWAUKEE, WIS.—G. H. Hamilton, formerly sales manager of the G. & J. Tire Company, and later of the Kokomo Rubber Company, has severed his connection with the last named concern and has accepted a similar position with the Federal Rubber Manufacturing Company, of this city.

MONTREAL, QUE.—Charles Arnold, former manager of the National Motor Company, has organized a new automobile concern, called the International Car Agencies, with headquarters at 855 St. Catherine street, West. The International handles the Canada car, the Interstate and the Whiting.

ATLANTA, GA.—The Pope-Hartford car, represented by Steinhauer & Wright until that company gave it up to handle Cadillacs exclusively, has established a branch here with L. S. Crane, of Hartford, Conn., in charge. He is temporarily located at 34 Auburn avenue, but will soon secure a location on Peachtree street.

LANSING, MICH.—To place this city in first-class condition as regards fire hazard the National Board of Fire Underwriters has recommended the establishment of a new fire station with an automobile combined engine and hose-wagon, and the replacing of the present ladder-truck by an automobile 75-foot aerial truck.

TOLEDO, O.—A new corporation known as the Motor Car Sales Company has been organized here. L. E. Barger and C. A. Van Dusen will be in charge of the business of the concern, which will handle the Abbott-Detroit cars. Mr. Barger has had charge of the local agency of the Abbott Motor Sales Company since last August.

CHICAGO, ILL.—The Findeisen & Kropf Manufacturing Company, manufacturer of Rayfield carbureters, has added to its list of distributors the following dealers: Ballou & Wright, 86 Sixth street, Portland, Ore., Browne & Leacy, Bank building, Savannah, Ga., Joseph Woodwell Company, 201 Wood street, Pittsburgh, Pa.

NEW YORK CITY—On page C-7 of the Carbureter and Ignition department of the advertising section of THE AUTOMOBILE for January 4, through an unfortunate error in the composing room, a wrong cut was substituted for the cut showing the up-to-date Master Vibrator, the coil now manufactured by the Kokomo Electric Company, of Kokomo, Ind.

AKRON, O.—One of the innovations introduced to the automobile tire industry this year is that of the opening of a special department in the plant of The Goodyear Tire & Rubber Company, for the purpose of showing visitors through the big plant in such a way that when they have completed the tour they have a very good understanding of the process of tire construction.

COLUMBUS, O.—D. W. Singleton, receiver for the Dunlap Engineering Company, of Columbus, O., which has a plant on Parsons avenue for making automobile parts, has transferred the plant to T. C. Dunlap for a consideration of $37,000. The plant in turn was transferred to the Dunlap Manufacturing Company, a new corporation formed to take over the plant and operate it.

TOLEDO, O.—James Baumgardner and Vernon Kibby have opened temporary quarters in the rooms occupied by the United Garage, at 915 Jefferson avenue, where under the name of the Marathon-Toledo Sales Agency they will handle the Marathon car built at Nashville, Tenn. A show room and office will be opened as soon as suitable rooms can be secured. The concern will act as distributors for northwestern Ohio.

TOLEDO, O.—H. E. Throne has opened quarters at 820-822 Madison avenue, where he will handle the Mitchell. He has thirteen counties in northwestern Ohio. Associated with him are F. Fordham, Jr., who for four years was connected with the local Buick agency, C. L. Sturtevand, of Delta, O., and H. E. Hoffman, of Bryan, O. Prior to assuming the distribution of Mitchell cars Mr. Throne conducted a branch sales agency at Bryan.

KisselKar ambulance now in service for the Cook County (Ill.) Hospital

ALTOONA, PA.—Walter T. Mozer has sold his interest in the automobile firm of Mozer & Lamp to Frank Kramer, of this city.

BELLEFONTE, PA.—R. D. Tonkin, John Cosgrove and E. A. Irwin have secured the patent rights for the manufacture of the Thermal engine.

DALLAS, TEX.—The newly organized Cole distributing agent here has incorporated under the name of the Henderson-Cole Motor Company.

PHILADELPHIA.—Henry E. Schoch will build a garage and automobile salesroom at Eighteenth and Market streets. The structure will cost $100,000.

ATLANTA, GA.—Frank Whiteside has taken the position of advertising and sales manager of the Southern branch of the Mitchell-Lewis Motor Company.

MOLINE, ILL.—Nelson T. Gutelius, formerly of the St. Louis *Post-Dispatch*, has been made advertising and sales manager of the Midland Motor Company.

NEW YORK CITY.—William M. Gage has taken the position of sales manager of the Colt-Stratton Company, of this city, general Eastern distributor for the Cole car.

BUTLER, PA.—The Butler County Auto Company has elected J. N. Patterson president, A. E. Butler, vice-president, J. Younkins, treasurer, and G. A. Evans, secretary.

HARRISBURG, PA.—Thomas E. Boyd, formerly clerk in the State Banking Department, has been appointed registrar of the automobile division of the Pennsylvania State Highway Department.

UTICA, N. Y.—The Utica Motor Company, of this city, agent for the Cadillac, is remodeling its garage and offices to care for increased business. The company plans to have its entire business on one floor as well as under one roof.

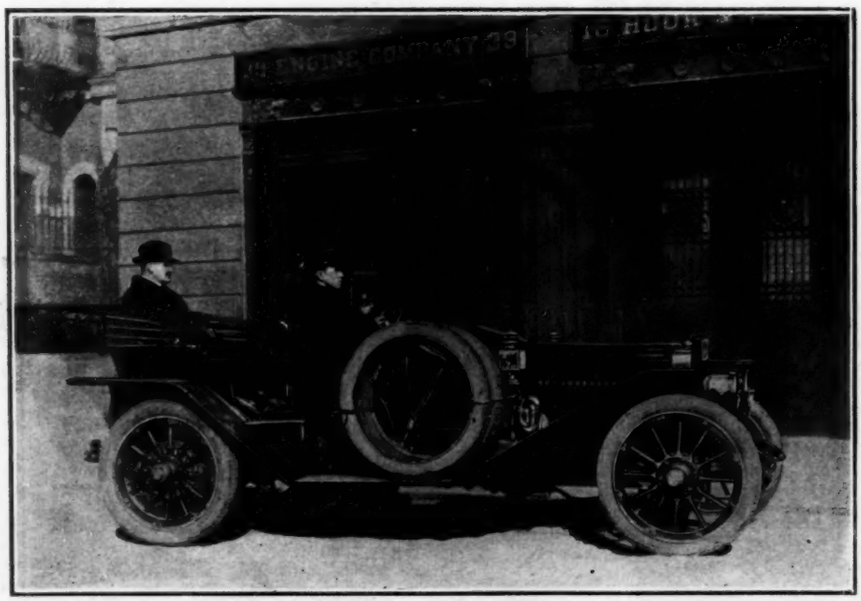
GRAND RAPIDS, MICH.—The Moran Auto Sales Company has closed a contract with the Velie Chicago branch for the sale of Velie pleasure and commercial cars in this territory. The company will install a service station in connection with the sales department.

MILWAUKEE, WIS.—The Stutz Motor Car Company, of Wisconsin, is erecting a garage and salesroom on the East Side. The company will handle the Stutz car in Wisconsin. The motor in this car is made by the Wisconsin Motor Manufacturing Company, of this city.

DETROIT, MICH.—The Timken Roller Bearing Company and the Timken-Detroit Axle Company have engaged Myron Townsend as assistant advertising manager. Mr. Townsend will make his headquarters at the office of the Timken Roller Bearing Company at Canton, O.

GALVESTON, TEX.—The Interstate Sales Company, of this city, is to open a branch in Houston, Tex. The company handles the Interstate, Thomas, Everift and Commerce cars and has branches at Dallas, Fort Worth, Texarkana, Corpus Christi, Alvin, Orange, Port Arthur and Beaumont.

FLINT, MICH.—D. K. Moore, vice-president and one of the organizers of the American Distributing Company, of Jackson, Mich., has accepted the position of general sales manager of the Weston-Mott Company, of this city. Mr. Moore retains his interests in the American Distributing Company.



Fire Commissioner Johnson in his Lozier department car

Automobile Incorporations

AUTOMOBILES AND PARTS

CAMDEN, N. J.—United Motors Company; capital $125,000; to manufacture automobiles, motors, etc. Incorporators: M. N. Carroll, W. B. MacDonald, H. Berger.

CHICAGO, ILL.—Excelsior Motor Manufacturing & Supply Company; capital, $500,000; to manufacture automobiles and parts. Incorporators: A. A. Worseley, M. Loehwing, S. W. Jackson.

CHICAGO, ILL.—Hart Motor Car Company; capital $10,000; to manufacture automobiles and accessories. Incorporators: F. P. Hart, K. Byllington, C. G. Stroher.

CHICAGO, ILL.—Rene Safety Auto Wheel Manufacturing Company; capital $50,000; to manufacture automobiles and accessories. Incorporators: J. Ayotte, C. F. McKay, J. E. Evans.

CHRISMAN, ILL.—Rayfield Motor Company; capital $75,000; to manufacture automobiles and motors. Incorporators: F. K. Thayer, A. E. Schnitker, E. E. Steley.

CLEVELAND, O.—Weger Motor Company; capital $100,000; to manufacture internal combustion motors. Incorporators: E. C. Rock, J. B. Seymour, E. A. Williamson, L. M. Lamoreaux, J. R. Updike.

DES MOINES, IA.—Bernhard-Turner Automobile Company; capital $60,000; to engage in the automobile business. Incorporators: J. C. Bernhard, J. E. Turner.

DOVER, DEL. Airease Tire Filler Company; capital $100,000; to deal in automobile and motorcycle tire fillers.

DOVER, DEL.—Randolph Motor Truck Company of Delaware; capital $200,000; to manufacture and deal in motor trucks. Incorporator: H. O. Coughlan.

GRAND RAPIDS, MICH. Robert Willey Automobile Company; capital $25,000; to deal in automobiles, etc. Incorporators: R. A. Willey, A. F. Willey, W. C. Root, E. L. Quackenbush, H. Blankfort.

MT. HOLLY, N. J.—Ottomobile Company; capital $500,000; to manufacture automobiles, supplies, etc. Incorporators: W. D. Marren, W. S. Rendell, W. S. Jones.

PHILADELPHIA—American Motor Parts Company; capital $10,000; to engage in the automobile business.

READING, PA.—Four Wheel Auto Jack Company; capital, $5,000; to manufacture automobiles and supplies.

RICHMOND, VA.—Norfolk Automobile Trade Assn.; capital, $200 to $2,500; to hold automobile shows. Incorporators: T. G. Coburn, W. Broderick, J. K. Waterman.

ST. LOUIS, MO.—Missouri Auto & Supply Company; capital $2,000; to engage in the automobile business. Incorporators: B. W. Dalzell, W. Bennecke, W. F. Schwartz.

UTICA, N. Y.—Crim-Bronner Automobile Co.; capital, $5,000; to deal in automobiles. Incorporators: H. D. Crim, N. D. Bronner, C. W. Crim, M. G. Bronner.

WINDSOR, ONT.—Windsor Auto Axle Company; capital, $15,000; to manufacture automobile accessories. Incorporator: L. D. Cooley.

YOUNGSTOWN, O.—Drury-Wells Motor Company; capital, $10,000; to manufacture automobiles and parts. Incorporator: F. E. Drury.

GARAGES AND ACCESSORIES

BIRMINGHAM, ALA.—Highland Garage Company; capital $5,000; to operate a garage and sales agency. Incorporators: J. H. Hopper, C. G. Sharpe.

BURLINGTON, VT.—Champlain Garage Company; capital $10,000; to conduct a garage and engage in a general automobile business. Incorporators: H. R. Watkins, C. Morgan, L. W. Welch and others.

COLUMBUS, O.—Star Vulcanizer Manufacturing Company; capital $10,000; to manufacture automobile specialties. Incorporators: D. F. Detrick, W. L. Fox, N. J. Fountain and others.

DUNELLEN, N. J.—Service Garage, Inc.; capital $5,000; to operate automobile garages. Incorporators: E. A. Craig, W. W. Stryker, F. Harrington.

HOBOKEN, N. J.—Hudson Motor & Garage Company; capital $50,000; to do a general automobile business. Incorporators: C. C. Moller, R. W. Fulcher, M. Moller.

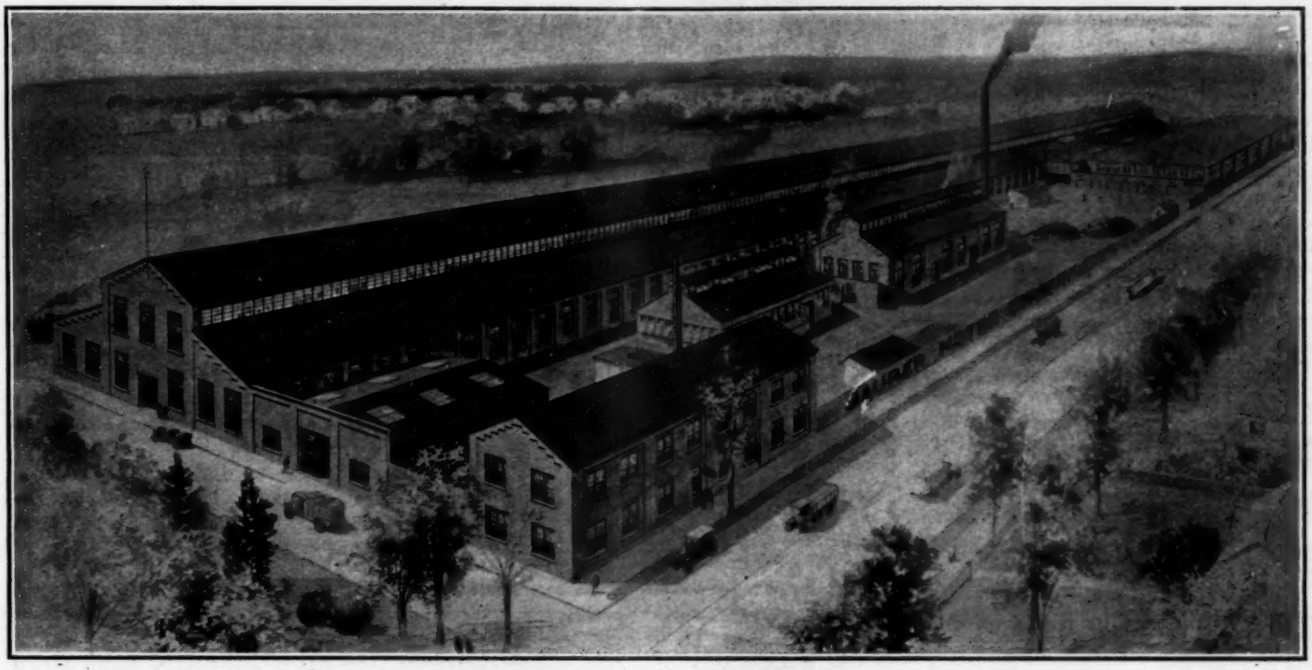
INDIANAPOLIS, IND.—International Pneumatic Wheel Company; capital $100,000; to manufacture a pneumatic wheel for automobiles. Incorporators: W. H. Alford, W. S. Johnson, J. M. Dennis.

NEWARK, DEL.—G. L. Williams; capital $50,000; to deal in automobile sundries and supplies. Incorporators: C. L. Williams, A. C. Hunt, A. Hammond.

SPRINGFIELD, O.—H. & S. Auto Company; capital $10,000; to operate an automobile garage and sales agency. Incorporators: J. W. Hennesey, J. P. Sulzbaugh, M. R. Sulzbaugh and others.

TOLEDO, O.—Indiana Invincible Starter Sales Company; capital $1,000; to deal in self-starters for automobiles. Incorporator: L. Z. Hetzorg.

OF INTEREST to the INDUSTRY



Bird's-eye view of the Saurer factory of the International Motor Company at Plainfield, N. J.

PLAINFIELD, N. J.—The buildings of the Saurer properties of the International Motor Company occupy a site of 5 acres adjoining the Clinton avenue station of the Central Railroad of New Jersey, and are parallel to their tracks. The buildings are five in number and of modern mill-type design, well lighted and ventilated. The main machine shop (as are the other buildings) is constructed of brick, steel reinforced, and is one story, occupying a space of 100 by 520 feet. The main machine shop contains a bay of approximately 30 by 200 feet. Two smaller shops for the manufacture of small parts and a modern power plant complete the productive buildings of the properties. The offices are housed in a two-story administration building.

SPRINGFIELD, O.—The H. & S. Auto Company, of this city, will build a garage and repair shop.

UTICA, N. Y.—The Utica Motor Car Company, of this city, has completed plans for extensive improvements to its plant.

ROANOKE, VA.—The Frantz Auto Corporation will start its vulcanizing plant during the present week. The plant is equipped to do all kinds of vulcanizing.

FLINT, MICH.—The Durant-Dort Carriage Company, of this city, will add a department to its plant for the manufacture of motor delivery wagons.

KANSAS CITY, MO.—A factory branch of the International Motor Company, of New York, has been opened at 1807 McGee street, in this city. Pierre Shon is manager.

TORONTO, ONT.—The local branch of the Dunlop Type Company has been obliged to add 30,000 square feet of floor-space to the factory in order to accommodate the rapidly increasing business.

GROVE CITY, PA.—The Bessemer Motor Truck Company, of this city, has completed experiments on an automobile engine which will use low grade fuel and it is now ready for the market.

AKRON, O.—The Goodyear Tire & Rubber Company is preparing to erect an electric light plant. It will be equipped with a 1,500-kilowatt generator and a 500-kilowatt motor generator set.

MT. HOLLEY, N. J.—The Ottomobile Company, recently incorporated with a capital of $500,000, will erect a factory here in the near future for the manufacture of Otto pleasure cars, trucks, motors and parts.

CAMBRIDGE, MASS.—The Berkshire Automobile Company, of Pittsfield, Mass., has decided to move to this city, a temporary factory having been secured near the Shoe & Leather Building here. Later on a new building will be erected.

INDIANAPOLIS, IND.—The Empire Gear & Manufacturing Company, recently incorporated, has secured a factory building and installed a full equipment of machinery for the manufacture of motors, transmissions, rear systems and other automobile parts.

MILWAUKEE, WIS.—The Garage Equipment Manufacturing Company, of this city, has taken over the manufacture and sale of the Electrobola electric lamps. These lamps, which are patented, are made from one solid aluminum casting. This construction gives them great strength, durability and the maximum of reflecting surface.

GIBSONBURG, O.—The Gibsonburg Commercial Club has completed plans for the sale of stock of the Lauth-Juergens Motor Car Company, of Fremont, O., to the extent of $60,000 to $75,000. This will bring to Gibsonburg a large factory for making parts for the trucks made by the company. A large building, 200 by 60 feet, will be erected. H. S. Diller is sales manager.

BROCKVILLE, ONT.—The Brockville Atlas Motor Car Company, with a capital of $200,000, has been established here. A new factory with all the latest facilities is in the course of construction. The company will build pleasure and commercial cars. All the parts will be built by the company with the exception of the engine and the body. The engine will be the output of the Atlas Engine Works, of Indianapolis, Ind., and the bodies will be constructed by the Canada Carriage Company. T. J. Storey is managing director of the company.

PATENTS GONE TO ISSUE

TWO-CYCLE ENGINE—In which the flow of gases is controlled by positive-working valves.

1. This patent refers to an engine, Fig. 1, which consists of a number of cylinders having gas inlet valves, and a mechanism for opening these valves at each cycle of operations when the exhaust ports are closed. A gas manifold communicates with the inlet ports of the cylinders, and through this manifold combustible gas is directed into the cylinders after having been compressed for this purpose in suitable apparatus.

Means are provided to maintain a certain pressure in the manifold when the engine is in operation. An auxiliary exhaust manifold is provided into which lead auxiliary exhaust valves opening and closing during each cycle of operation, and there are some means of creating a partial vacuum in the exhaust manifold mentioned in the description given above.

No. 1,014,078—to James J. McGuire, St. Louis, Mo. Granted January 9, 1912; filed June 9, 1910.

MECHANICAL MOVEMENT—A device adaptable for transmitting various sorts of motion.

2. Fig. 2 shows the subject matter of this patent, comprising an actuated member, as well as an actuating member with means for operating it; both members are slidably arranged in a straight line and capable of moving in the same direction. On the actuating member a lever is supported which is operatively connected therewith: the lever has a projection, while a controller has a slot to receive the projection, the controller being pivoted on a stationary part. There are some means on the stationary part and controller for locating the latter in different fixed positions while at the same time it maintains the position of its pivot.

No. 1,014,184—to Ernest R. Seward, assignor to the Hartford Machine Screw Company, Hartford, Conn. Granted January 9, 1912; filed June 10, 1908.

WRENCH—A construction containing a rotatable gripping section into which enters a slidable lock.

1. This wrench (Fig. 3) has parallel outer and inner jaws, and some means of moving the inner jaw along a rectangular shank integral with the outer jaw, the shank comprising two L-shaped interchangeable drawbars. The latter are screw-headed and rounded on their exterior surfaces and their approximal surfaces are in contact with the narrower sides of the rectangular shank and are adapted to slide upon the same.

A metallic grip section is provided which is axially rotatable but fixed longitudinally in relation to the shank; the section has a circular wooden filling on the shank. There is also a metallic fixed section with a circular wooden filling on it. A slidable lock is entered in the rotatable section for attaching it to the fixed section, and a hexagonal nut is integral with the rotatable grip section, it having internal screw-threads engaging the external threads of the draw-bars.

No. 1,014,251—to Jacob Alpheus Overlander, White Plains, N. Y. Granted January 9, 1912; filed December 18, 1909.

EXPLOSION ENGINE—In which air is compressed for compression or scavenging purposes.

3. This engine, Fig. 4, is of the four-cylinder type and comprises a cylinder and crankcase in which latter air is compressed twice in each cycle of strokes. There are some means for transferring the compressed air from the crankcase to the engine cylinder.

A selective control mechanism is provided by means of which air may be admitted from the crankcase to the cylinder, either for scavenging or augmenting the charge therein. These means are also adapted for completely cutting off the communication between the transfer means and the engine cylinders.

No. 1,014,270—to John G. Utz, assignor to Chalmers-Detroit Motor Company, Detroit, Mich. Granted January 9, 1912; filed April 9, 1909.

AUTOMOBILE LOCK—Designed to prevent removing of the car.

1. This patent refers to a device having a stationary barrel and a rotatable bolt in the same. One end of the bolt extends beyond the barrel and forms a number of faces.

To the stationary barrel is secured a spring which engages one of the faces so as to yieldingly hold the bolt from turning. A tubular casing encloses barrel and spring, and a shaft is pivotally attached at one end to the end of the bolt extending beyond the barrel.

No. 1,014,145—to David P. Graham, Detroit, Mich. Granted January 9, 1912; filed January 9, 1911.

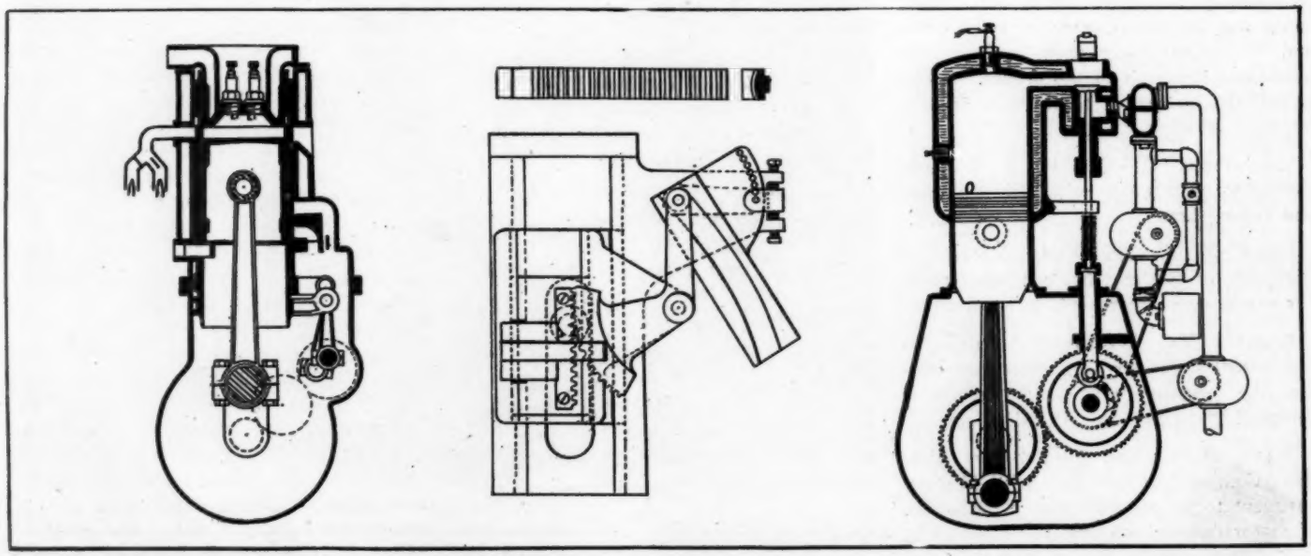


Fig. 1—McGuire two-cycle engine Fig. 2—Seward mechanical movement Fig. 3—Overlander wrench Fig. 4—Utz explosion engine